11/96

SERVICE MANUAL

HIGH-RESOLUTION DISPLAY MONITOR
MODEL XC-2930C

Remote inop see pg 43

MITSUBISHI ELECTRIC CORPORATION
SEP. 1993

CBB-S5555

X-RADIATION WARNING

The surface of picture tube may generate X-Radiation.
Precaution during servicing, and if possible use of a lead apron or metal for shielding is recommended. To avoid possible exprosuer to X-Radiation and electrical shock hazard, the high voltage compartment and the picture tube shield must be kept in place whenever the chassis is in operation.
When replacing picture tube use only designated replacement part since it is a critical component with regard to X-Radiation as noted above.

CRITICAL COMPONENT REPLACEMENT WARNING

- The components marked " ⚠ " are critical components for X-ray radiation. When replacing these parts, use exactly the same one indicated in parts list.
- Please do not remove the seal of sealed potentiometer.
- The components stated below are no field serviceable parts. If broken, please contact with qualified personnel of Mitsubishi Electric Corp. or the distributor which indicated on name plate.
  VR701(HV-LIMIT) T701(FBT)

The socket-outlet shall be located near the equipment and shall be easily accessible. During service, disconnect the plug from the socket-outlet.

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POWER	
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AUDIO, SW	
DEFL	
HV	

TENTATIVE

1. SPECIFICATION

TECHNICAL SPECIFICATIONS of 29inch MONITOR

(XC-2930C)

1. CRT

Size	:	29inch (27V)
Stripe pitch	:	0.79mm (Center)／0.94mm (Corner)
Face plate	:	Tint (51%), Anti-Static charging coat

2. SCANNING

Horizontal Freq.	: 15kHz~82kHz	Auto-Tracking	T. B. D
Vertical Freq.	: 40Hz~120Hz	〃	

3. RGB INPUT (Analog input)

No. of Input	:	Two (2) input
Signal Level	:	0.7Vp-p 75Ω
Sync. Signal	:	Separate sync. TTL／0.3V
		Composite sync.
		Sync. on Green
Input Connector	:	BNC (RGB-1)
		Dsub-15P (RGB-2)

4. VIDEO INPUT (Composite-Video input)

No. of Input	:	Two (2) input (with S-VHS input)
Video Standard	:	NTSC, PAL, SECAM (Auto-Select)
Signal Level	:	1.0Vp-p, 75Ω
Input Connector	:	BNC, RCA Pin-Jack, S-VHS (to VIDEO-1)

5. AUDIO

No. of input	:	Three (3) input (VIDEO-1, VIDEO-2, RGB-1 or 2)
Amplifire	:	3W + 3W
Speaker	:	1W + 1W

6. DISPLAY SIZE

Video	:	540mm×405mm
RGB	:	500mm×375mm

7. CONTROL

Front Panel	:	Power, Degauss, Input Select, Contrast, Brightness Volume, Picture adjust, etc. ···
Remote Control (Wireless)	:	Same as aboves
Ex-Control	:	Power, Degauss, Input Select,

8. OTHER FUNCTIONS

Picture Adj Memory	:	15 kind of computers can be memorised
Degauss	:	Auto/Manual

9. POWER SOURCE

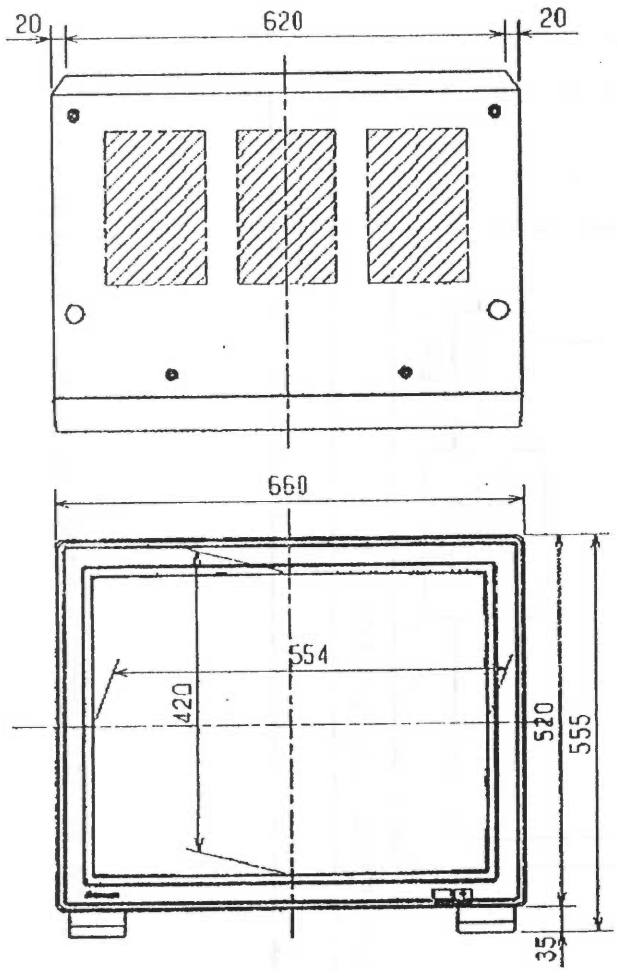
Power Source	:	100~120V/200~240V auto-select 50/60 Hz
Power Consumption	:	300W max. T. B. D

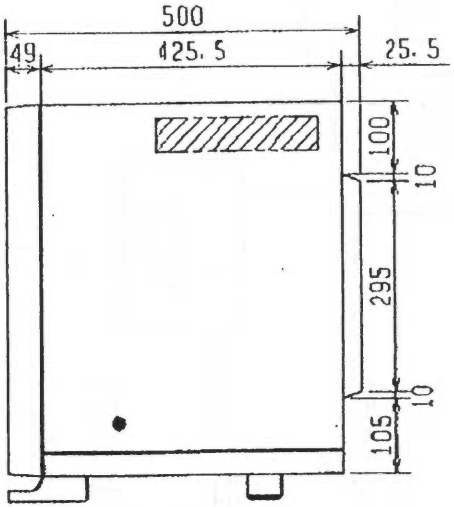
10. CABINET DEMENSIONS

Demensions	:	660(W)×555(H)×500(D)
Weight	:	59kg

11. REGULATORY

EMI	:	FCC-A, (VDE-B)
Safety	:	UL, CSA, (IEC)
X-Ray	:	DHHS, HWS, (PTB)
		( ) ··· T. B. D





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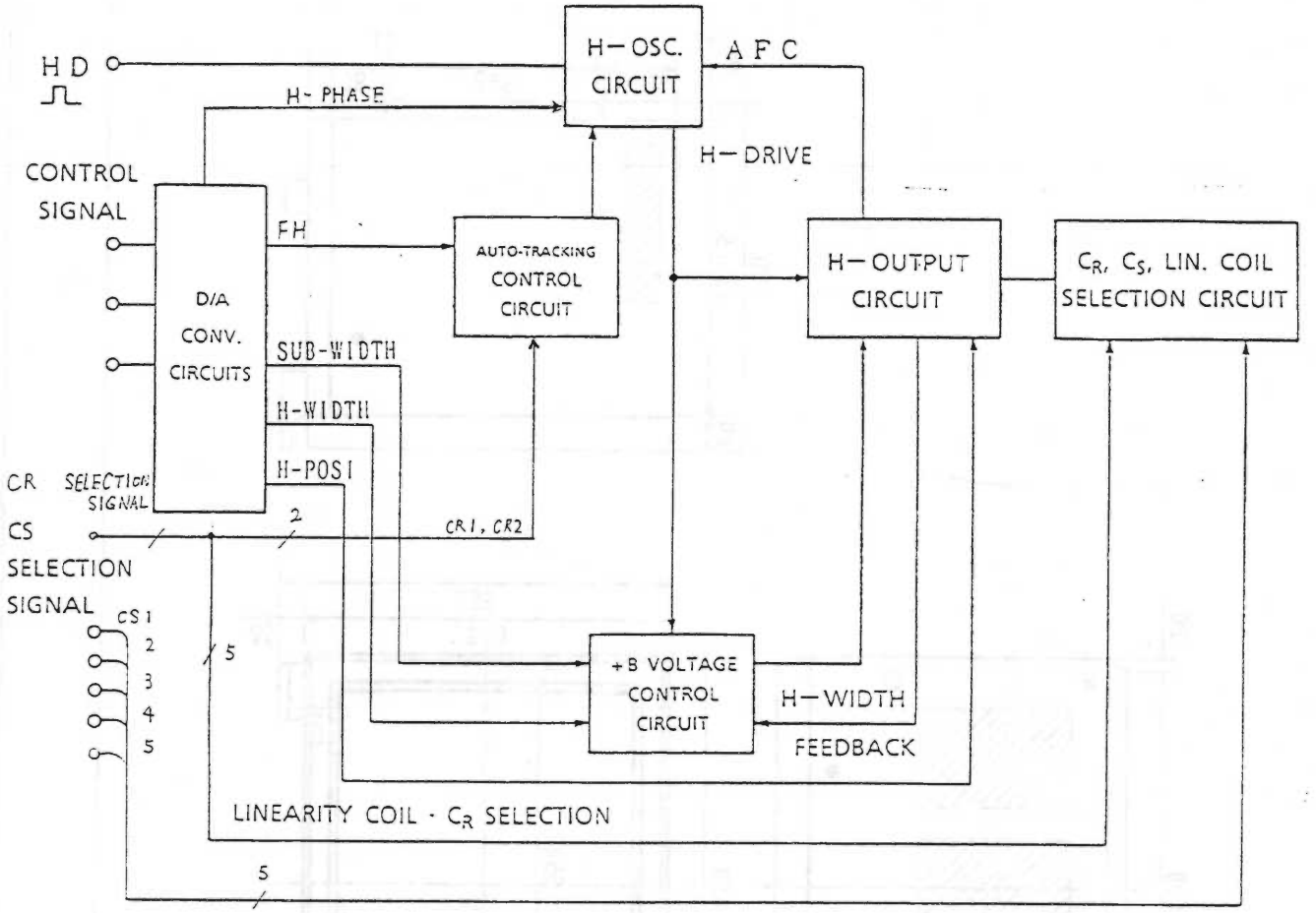
2. CIRCUIT DESCRIPTION

2.1 HORIZONTAL DEFLECTION CIRCUIT

The horizontal deflection circuit is composed of the following block.



BLOCK DIAGRAM OF HORIZONTAL DEFLECTION CIRCUIT

2.1-1 HORIZONTAL AUTO-TRACKING CONTROL

(1) Operation

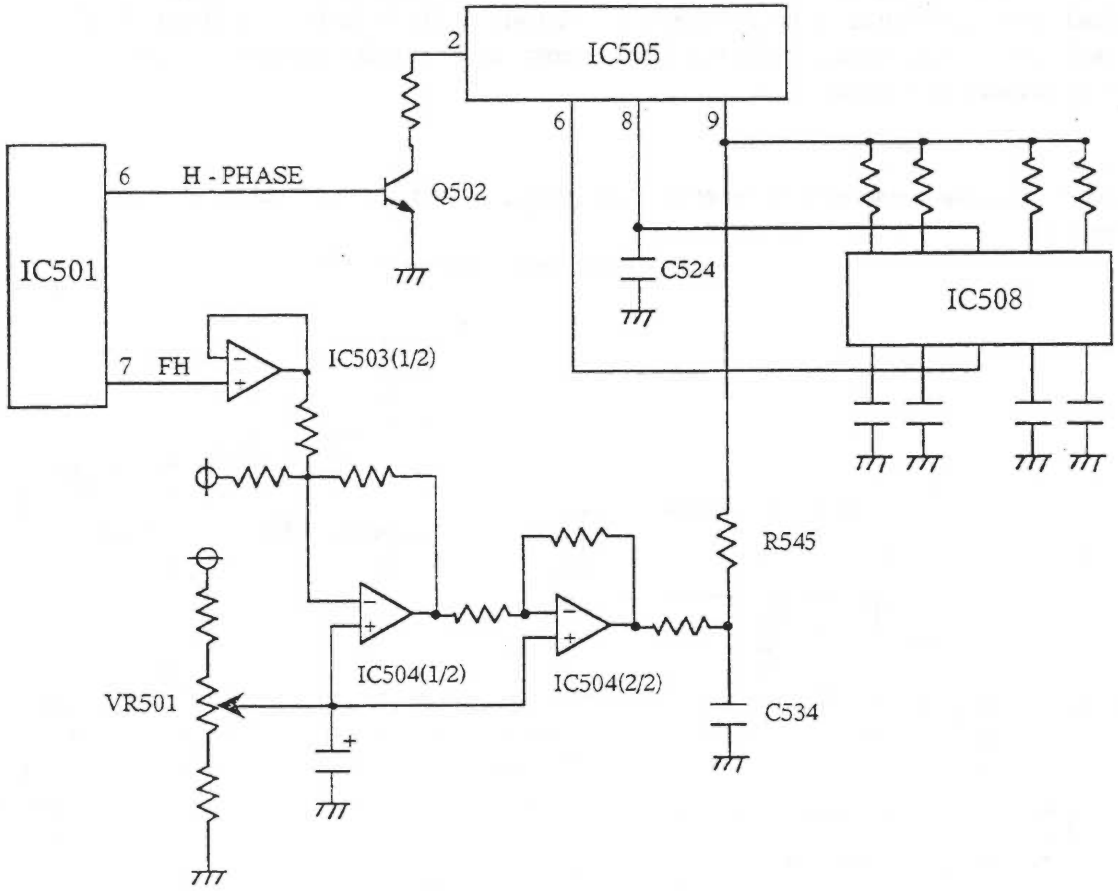
The horizontal auto-tracking circuit is composed of IC501, IC503 (1/2), IC504, IC505, IC508 and peripheral circuits, which function is performed by the control of charge or discharge current of C534 connected to 9pin of IC505. The conversion of frequency to voltage is performed by the micro computer (IC211), D/A converter (IC501), IC504 and IC503 (1/2).

VR501 can compensate the dispersion of components in the auto-tracking circuit.

Which controlls the horizontal oscillation frequency of IC505 as the auto-tracking function.

The output voltage from IC503, IC504 controlls the horizontal oscillation frequency of IC505 as the auto-tracking function.

(2) Circuit



2.1-2 +B VOLTAGE AND HORIZONTAL CONTROL

(1) Operation

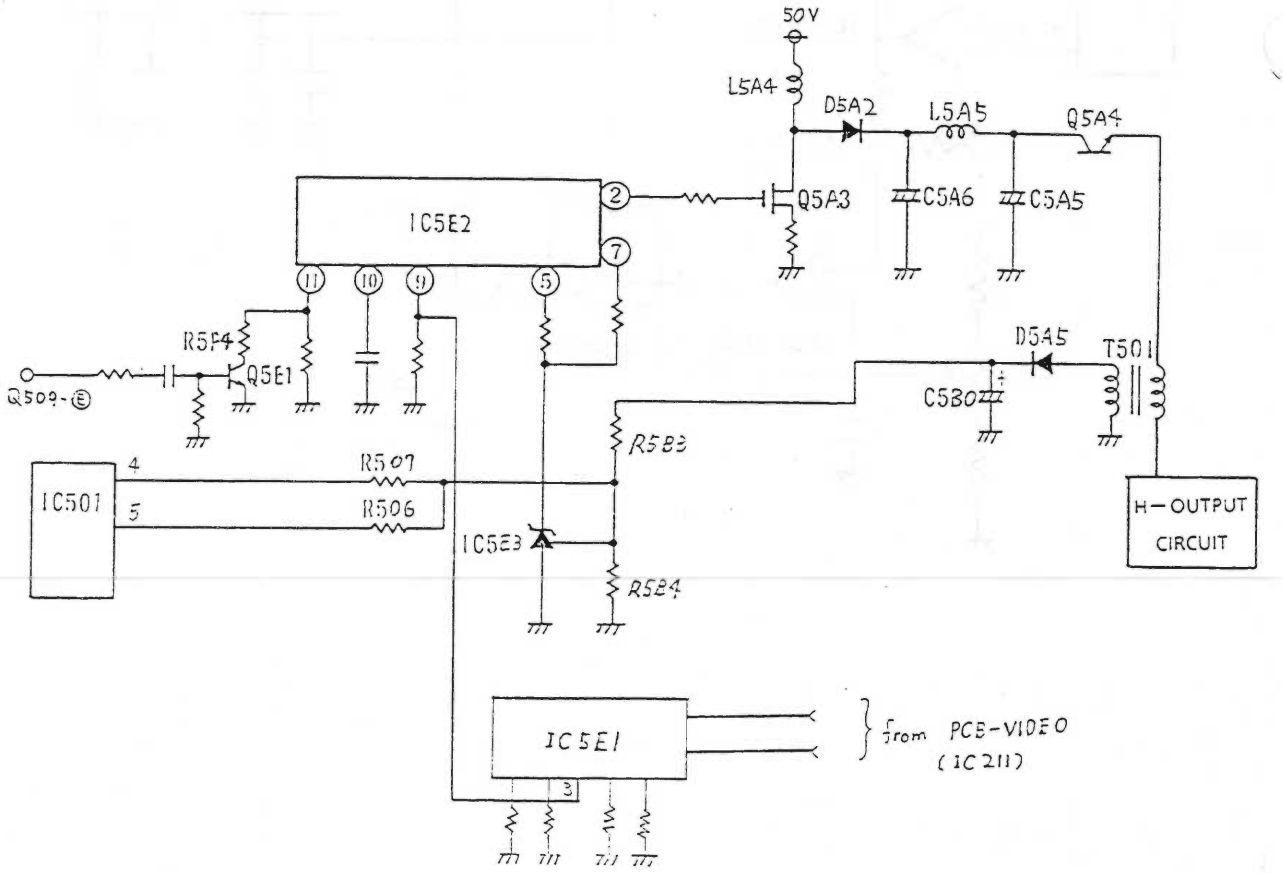
The power supply line for the horizontal deflection circuit is generated by the switching regulator (boost up convertor) which is synchronized with horizontal oscillation frequency. The oscillation frequency of IC5E2 is determined by some capacitors and resistors, connected to 9, 10 and 11 pin. To synchronize the oscillation frequency to the horizontal input signal, transistor Q5E1, connected to 11 pin of IC5E2, is turned on at the edge of rise time of output pulse from Q509, so the current from 11 pin flows to the ground level via Q5E1.

The output pulse from 2 pin of IC5E2 drives boost up convertor which is composed of Q5A3, L5A4, D5A2 and C5A6. The output from the boost up convertor is provided to Q5A4 of the side PCC, T501 of the HOT (Horizontal Output Transformer) and the horizontal output circuit.

The output pulse from secondary winding in T501 is rectified by D5A5 and C5B0, and is fed to IC5E2 as the feedback via IC5E3 of shunt regulator, so the collector pulse of Q5B0 ~ Q5B5 is stabilized to costantly, when change the horizontal frequency. The horizontal width is also stabilized, which is performed by the output from D/A convertor (IC501) to IC5E3 via R506 and R507. The duty ratio of output pulse from 2 pin of IC5E2 is controlled by changing the valve of resistor which is connected to 9 pin of IC5E2.

(2) Circuit

The value of resister connected to 9 pin of IC5E2 is changed by switching IC5E1 which works as analog switch.

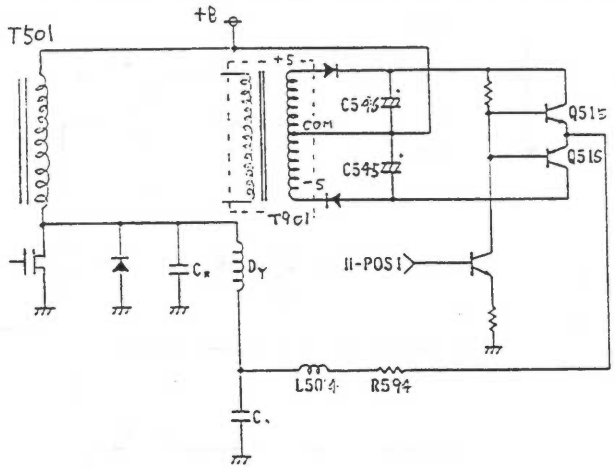


2.1-3 HORIZONTAL POSITION CONTROL

(1) Operation

The control of horizontal raster position is performed to provide the DC bias current to the horizontal deflection coil, the route of bias current is; C546, C545 <---------> Q515, Q516 <---------> R594 <---------> L504 <---------> DY <---------> C546, C545.

(2) Circuit



2.1-4 C_S, LINEARITY COIL AND C_R SELECTION

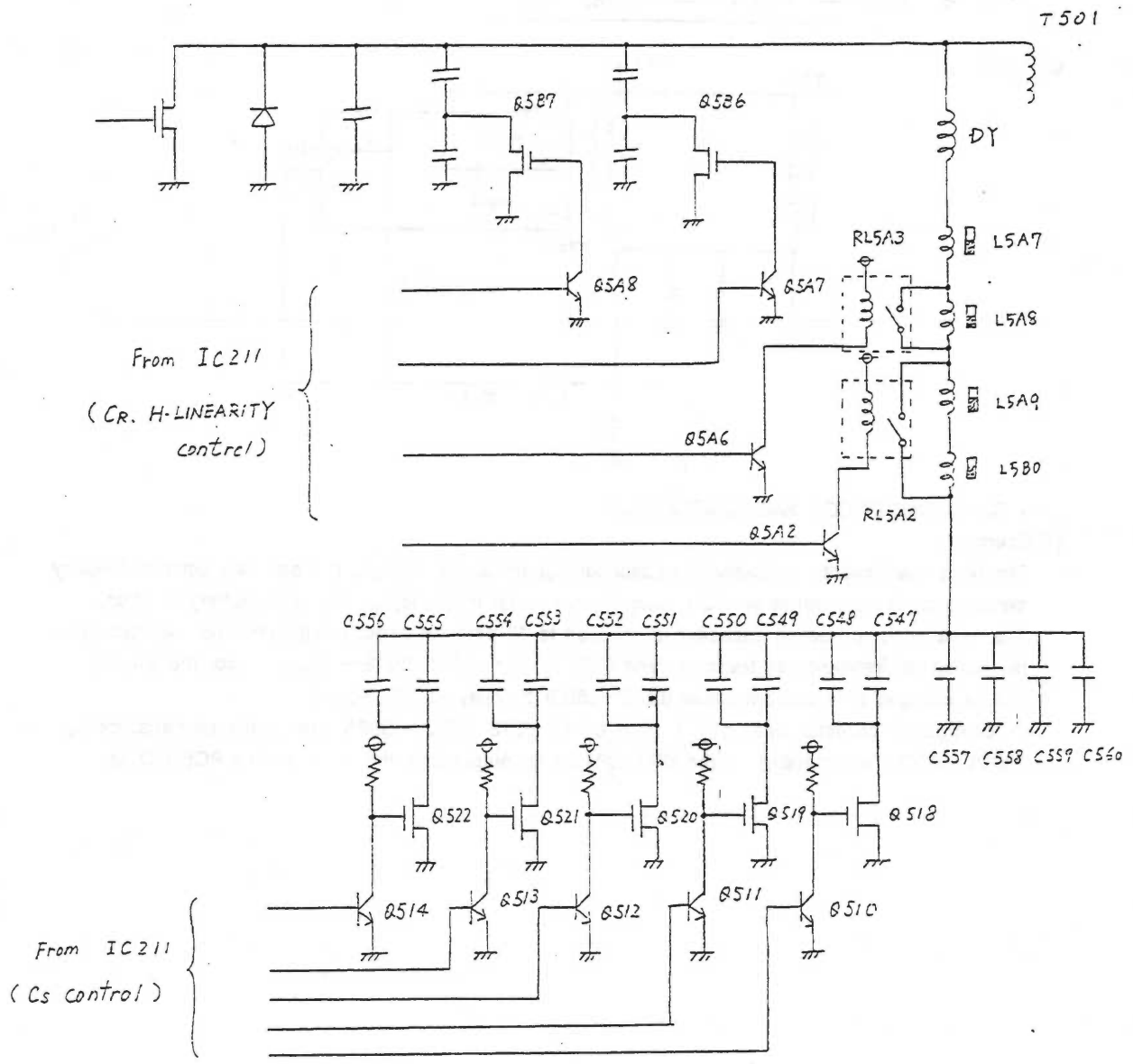
(1) Operation

The horizontal linearity compensation capacitor (C_S) should be changed to obtain the optimum linearity performance in accordance with changing the horizontal frequency as the auto-tracking function.

The linearity compensation capacitor is changed to 10 different capacities (C547~C556) according to the horizontal frequency by transistor and FETs Q510 ~ Q514, Q518 ~ Q522. Also, the linearity coil is changed to 4 different values (L5A7~L5B0) by relay RL5A2, RL5A3.

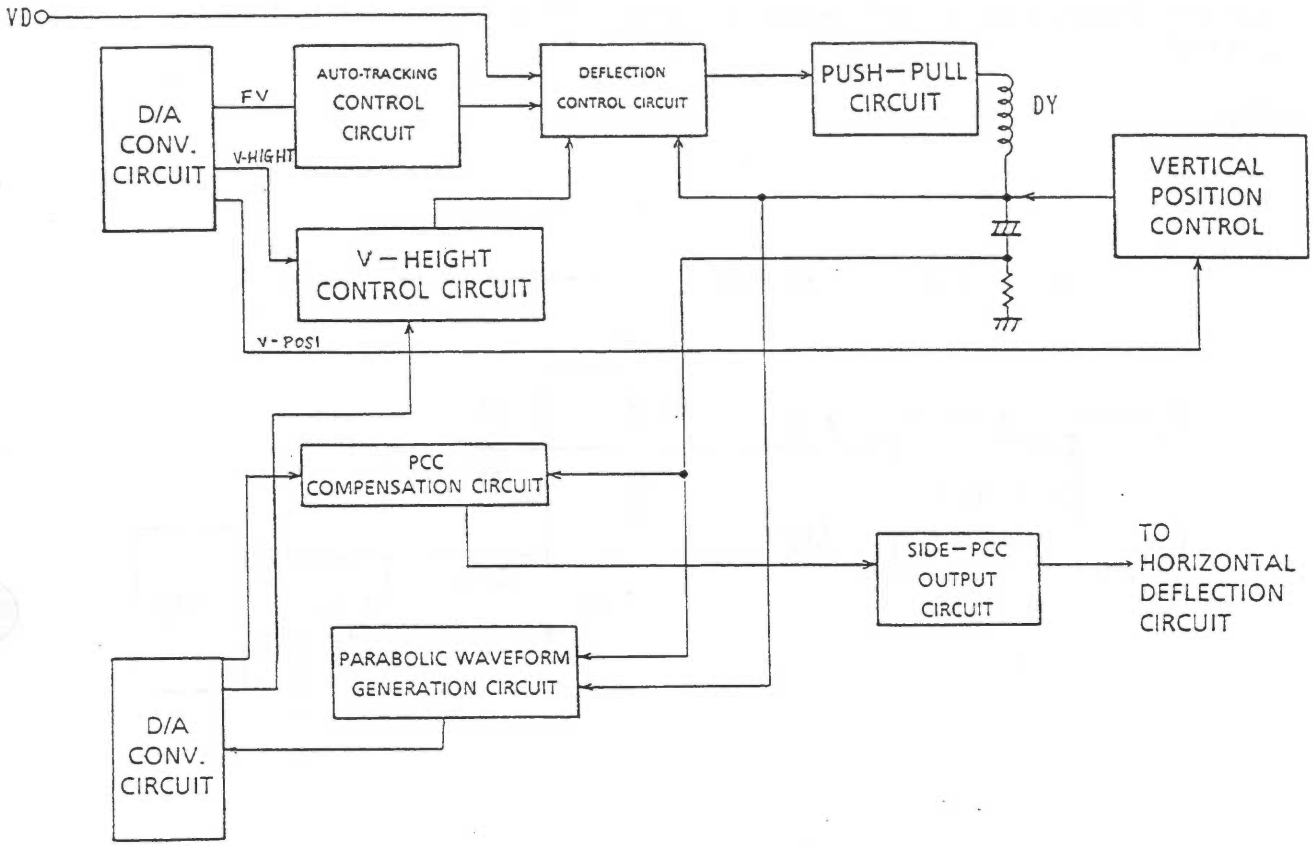
To controll the collector pulse of horizontal output FETS Q5B0 ~ Q5B5, the resonance capacitor C_R (C5C8 ~ C5D1) are changed by the CR3, CR4 signal output from the IC211 on the PCB-VIDEO.

(2) Circuit


T501
DY
Q527
Q526
RL5A3
L5A7
L5A8
L5A9
L5B0
Q5A8
Q5A7
Q5A6
Q5A2
RL5A2
From IC211
(CR. H-LINEARITY control)
C556 C555 C554 C553 C552 C551 C550 C549 C548 C547
C557 C558 C559 C560
Q522 Q521 Q520 Q519 Q518
Q514 Q513 Q512 Q511 Q510
From IC211
(Cs control)

2.2 VERTICAL DEFLECTION CIRCUIT

The vertical deflection circuit is composed of the following block.



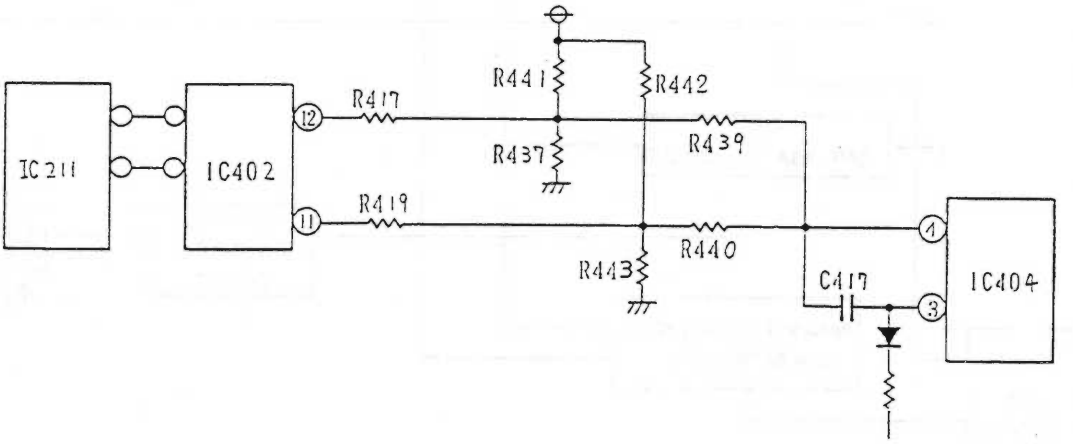
BLOCK DIAGRAM OF VERTICAL DEFLECTION

2.2-1 VERTICAL AUTO-TRACKING CONTROL

(1) Operation

The vertical auto-tracking function is performed by control of the charge or discharge current of C417, connected to 3 and 4 pin of IC404, which changes vertical free-running frequency.
The vertical input sync. signal is converted from frequency to voltage by IC211 on the PCB-VIDEO which is applied to the D/A convertor IC402. The output from 11 pin of IC402 is provided to C417 through R419 which changes vertical free-running frequency according to the input signal.
Also, V-HOLD control can be changed the output of 12 pin of IC402 which changes voltage of C417 through R417.

(2) Circuit



2.2-2 VERTICAL HEIGHT CONTROL

The vertical raster size is determined by the current of 7 pin of IC404. To obtain the constantly vertical raster size when change the vertical frequency, the output voltage from 10 pin of IC402 is provided to control the base bias of Q405. To control the vertical raster size(V-HIGHT), the output voltage from 9 pin of IC402 changes the current of 7 pin of IC404.

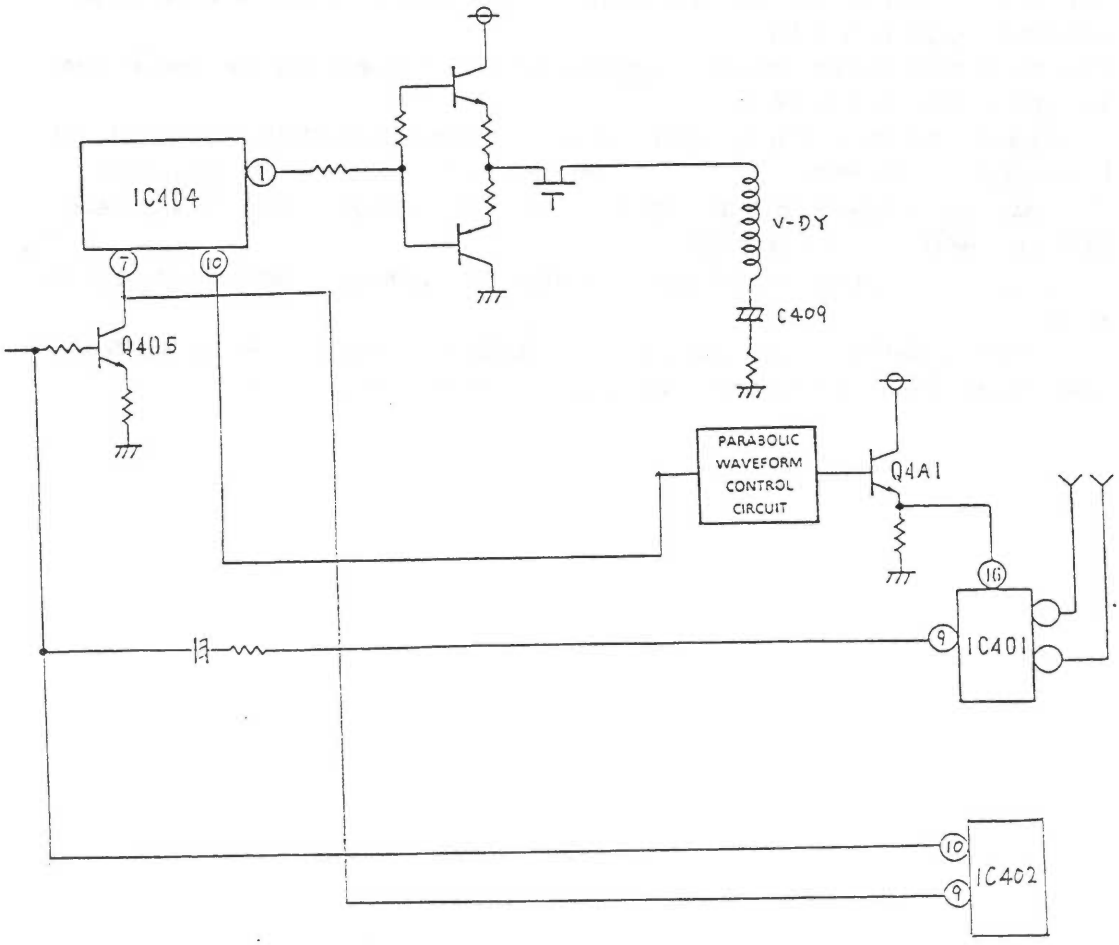
2.2-3 VERTICAL LINEARITY CONTROL

(1) Operation

The base voltage of Q405 is modulated to the parabolic waveform in vertical period for the vertical linearity control. The parabolic waveform is controlled to small amplitude at lower frequency, and is controlled to large amplitude at higher frequency by the micro computer of IC211.

The power supply, connected to the D/A convertor IC401, is modulated to the parabolic waveform, generated from vertical deflection circuit which changes output of D/A convertor IC401 when change the input frequency.

(2) Circuit



2.2-4 SIDE-PCC CONTROL

The SIDE-PCC(Pin Cushion Control) circuit works to compensate the side distortion of screen. The power supply voltage, connected to the horizontal output circuit is modulated to the parabolic waveform in the vertical period. The control of amplitude of parabolic waveform may compensate for combine the parabolic and sawtooth waveform for the compensation of trapezoidal distortion.

The sawtooth waveform generated from the pin 10 of the IC404 is provide to the operational amplifier IC4A4(1/2). The output from IC4A4(1/2) is provided to IC4A4(2/2) and then the parabolic waveform is generated from IC4A4(2/2). The output from IC4A4(2/2) as parabolic waveform is provided to the amplitude control circuit, composed of IC4A2(2/2), IC4A1(1/2) and IC4A1(2/2), which provides constantly amplitude waveform.

The power supply of IC401(pin 16) is modulated to parabolic waveform through the emitter follower Q4A1, and the amplitude of output from the pin 10 of IC401 is controlled by the micro computer IC211 on the PCB-VIDEO.

The sawtooth waveform provided through IC4A4(1/2) is provided to the differential amplifier, composed of Q4A4, Q4A5 and Q4A8 through the emitter follower Q4A7.

The inverted sawtooth waveform by Q4A4 is applied to R4C8, and amplitude of this waveform is determined by the output from the pin 14 of IC402 through the gain control transistor Q4A8 which is controlled by the micro computer (IC211). The not inverted sawtooth waveform through Q4A7 is applied to R4C7. The both sawtooth waveform (inverted and non-inverted) are combined on the connection point "A" in the following circuit, and is controlled either inverted or not inverted waveform by the output from the pin 14 of IC401.

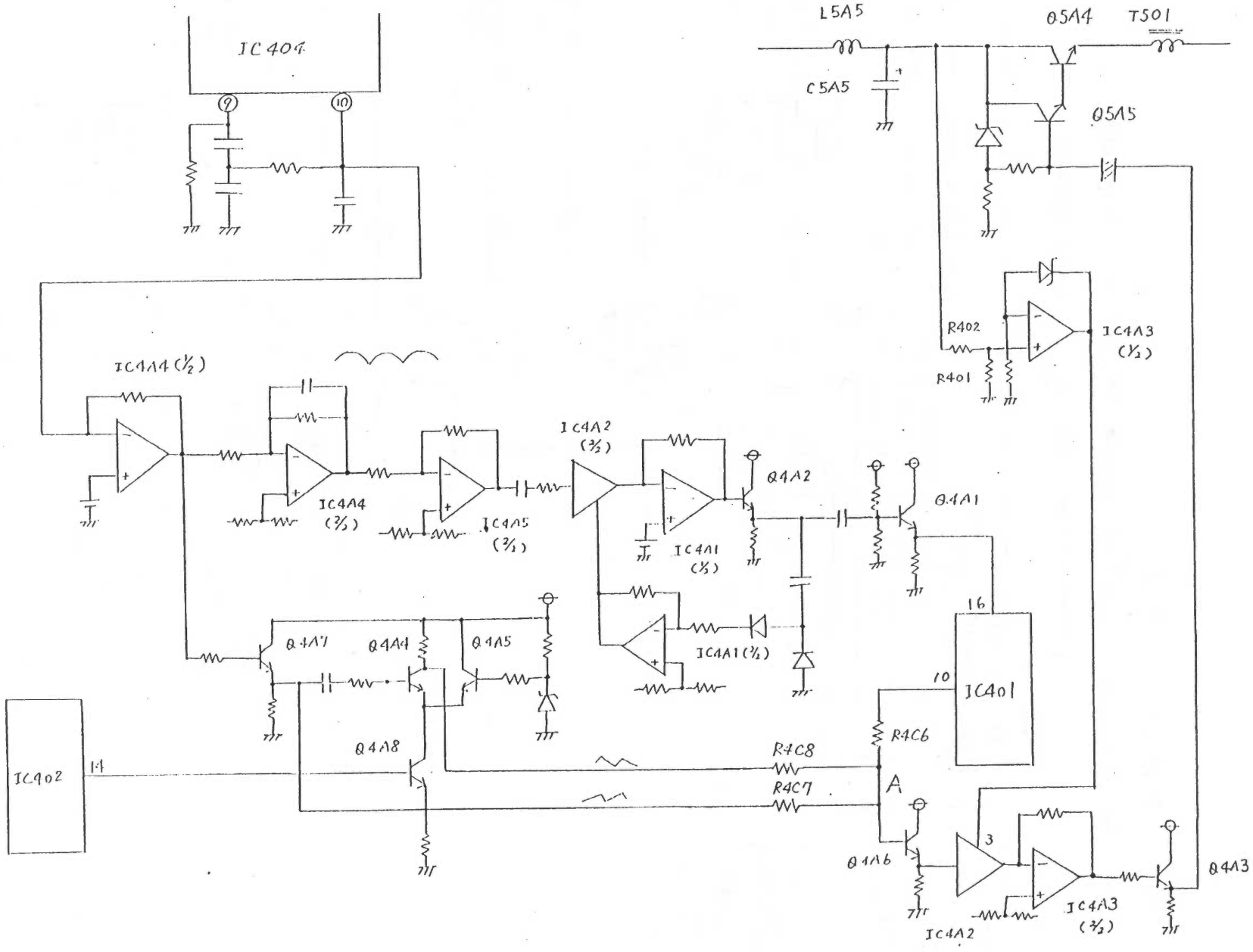
Also, the combined sawtooth waveform is applied to the base of Q4A6 so that the phase of parabolic waveform is controlled separate.

The waveform on marked "A" is connected to an amplifier composed of IC4A2(1/2), IC4A3(2/2) and IC4A3(1/2) through the emitter follower Q4A6 whose gain is determined by the voltage of C5A5.

The positive side voltage of C5A5 is fed to the control terminal(3pin) of IC4A2(1/2) through R402, R401 and IC4A3(1/2), so that the relation.

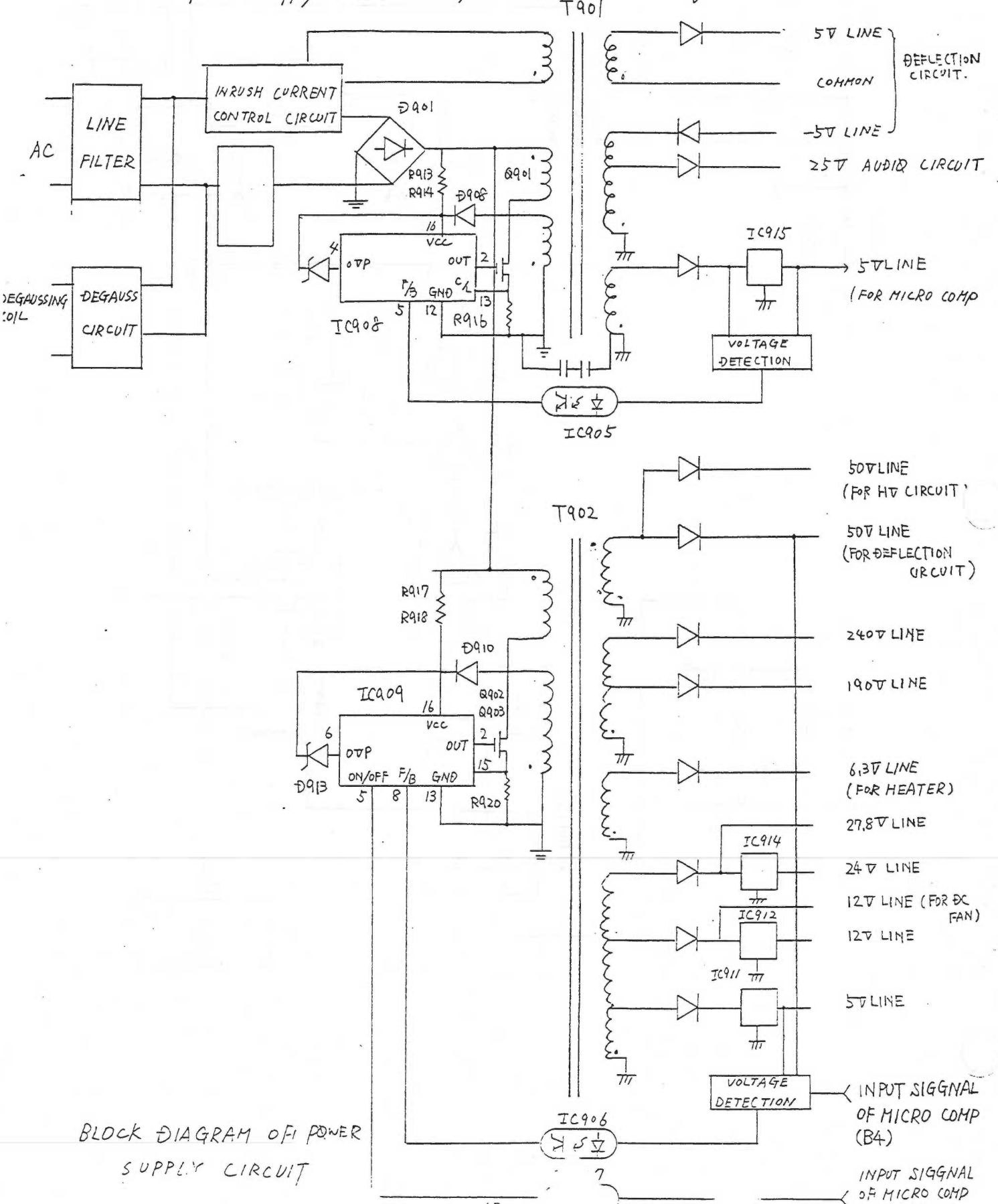
DC voltage of C5A5 and amplitude of parabolic waveform is maintained constantly regardless of input signal.

The output from IC4A3(2/2) is provided to the series regulator, composed of Q5A4 and Q5A5, via the emitter follower Q4A3 which modulates power supply line of horizontal output circuit.


IC404
9
10
L5A5
C5A5
Q5A4
T501
Q5A5
R402
R401
IC4A3 (½)
IC4A4 (½)
IC4A4 (½)
IC4A5 (½)
IC4A2 (½)
IC4A1 (½)
Q4A2
Q4A1
Q4A7
Q4A4
Q4A5
IC4A1 (½)
16
IC401
10
R4C6
Q4A8
R4C8
R4C7
A
IC402
14
Q4A6
3
IC4A2
IC4A3 (½)
Q4A3

2.3 POWER SUPPLY CIRCUIT

The power supply circuit is composed of the following block



BLOCK DIAGRAM OF POWER SUPPLY CIRCUIT

2.3-1 FEATURES

(1) The power supply circuit can be operated in case either 100 - 120VAC or 200 - 240VAC power line. The selection of power line voltage is per formed automatically.

(2) There are two kinds of switch in the power supply circuit on this monitor, one is used for the mechanical switch (main switch) and another is for the wireless remote control switch (sub swifch).

(3) The power supply circuit works as the switched mode operation with flyback method, and the pulse width modulation circuit in the switching regulator oscillates approx. 80KHz switching frequency.

(4) The output lines of power supply are as shown in below with their main loads.

Output Line	Main Load
240V	Video - Cut-Off Circuit
190V	Video, Deflection Circuit
12V	Video, Deflection, Scan Circuit
	DC Fan Power Supply
5V	Video, Deflection, HV
50V	HV, H-Deflection Circuit
27.8V	V-Deflection Circuit
24V	V-Deflection, HV Circuit
6.3V	CRT Heater

(5) The sub power supply voltage is supplied to following load.

Output Line	Sub Load (T901)
5V	Micro computer (IC211)
25V	Audio circuit
+5	H-Deflection circuit
Common	
-5	

(6) The following circuits are controlled by the output signal from micro computer (IC211).
B4 Voltage / Auto Degauss / Manual Degauss / DC Fan Control / ON/OFF Circuit for Sub-power.

2.3-2 PRIMARY RECTIFYING AND SMOOTHING CIRCUIT

(1) The power supply circuit can be operated in case either 100-120VAC or 200-240VAC power supply line by the selection of power line voltage is performed automatically.

(2) The AC input voltage is rectified by the diode bridge D901. The rectified voltage is smoothed by charging C908 and C909.

(3) In case of 100-120VAC line input, the rectify circuit works as a double voltage rectifier circuit controld by IC901.
In case of 200-240VAC line input, the rectify circuit works as a normal full wave rectifier circuit controld by IC901.

(4) The thermister, TH901 and TH902 connected to TRIAC IC903 is equipped to suppress the inrush current when turn ON the monitor.

(5) The TRIAC IC903 shunts the thermistor after began to start the oscillation of switching regulator in the power supply circuit.

2.3-3 DEGAUSSING CIRCUIT

(1) This monitor is provided the auto and manual degauss function.

(2) When degauss switch is turned on, the relay RY901 work to operate the degaussing circuit.
The posistor RP901 and RP902 are selected by RY901 according to AC input voltage.
The relay RY901 is switched automatically by IC901 depending on AC input voltage.

(3) When the sub-switch is turned on after the main switch turned on, the degaussing current flows to RP902 at 100-120VAC line input, and flows to RP901 and R902 at 220-240VAC line input.

(4) The manual degauss circuit is provided to push the degauss switch on the front panel, then the degauss current flows the same way stated in above.

(5) When the manual degauss switch will be used repeatedly, approx. 10 min. will be needed as the cooling time for the posistor.

2.3-4 SWITCHING REGULATOR CIRCUIT

1) PRIMARY CIRCUIT

(1) In case of T901, when the power switch is turned on, the starting voltage is provided to 14 pin of IC908 through R913 and R914. The switching regulator works to start the oscillation when the terminal of 14 pin of IC905 reaches over 16V, then inductive voltage is generated between 7 and 8 pin of T901 which is provided to 14 pin of IC908 through the rectifying and smoothing circuit composed of D908 and C919, as a power supply line.

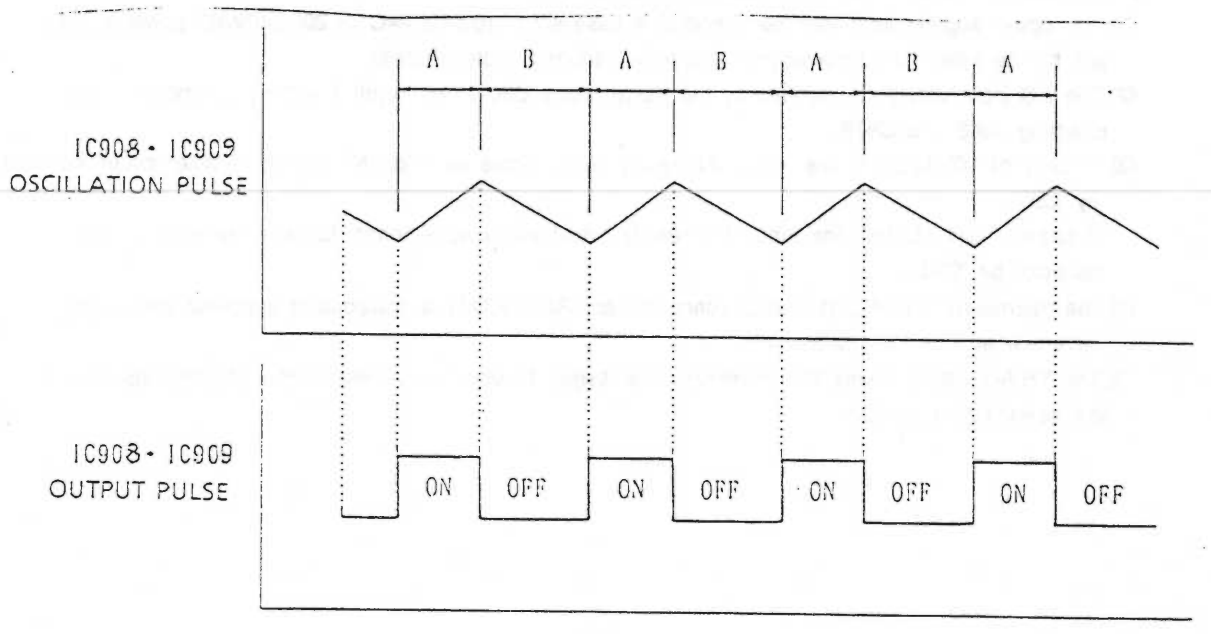
(2) In case of T902, the starting voltage is provided to 16 pin of IC909 through R917 and R918. The switching regulator works to start the oscillation when the terminal of 16 pin of IC909 reaches over 16V, then inductive voltage is generated between 7 and 8 pin of T902 which is provided to 16 pin of IC909 through the rectitying and smoothing circuit, D910 and C921, as a power supply line.

(3) The output voltage (50V line) for the deflection circuit from 10 pin of T902 is fed to 8 pin of IC909 via the photo coupler IC907 and programable shunt regulator IC916 which work as a feedback circuit.

(4) If the output voltage (50V line) from 11 pin of T902 is higher, the cathode current of programable shunt regulator IC916 increases then the current of diode in IC907 increases.
So the collector current of transistor in IC907 increases, and IC909 works to reduce the output voltage (50V line) of 11 pin of T902 by changing the pulse duty of output from 2 pin of IC909 to stabilize the output voltage.

(5) The output voltage (5V) from 9 pin of T901 is fed to 9 and 10 pin of IC908 for the feedback to stabilize the secondary voltage of T901.

(6) IC908 and IC909 oscillate approx. 80KHz, and provide the drive pulse from 2 pin which are applied to FET Q901 for IC908, Q902 and Q903 for IC909, for the switching operation.



(7) The waveform of oscillation pulse (10 pin of IC908 and IC909) is as shown in below.
In this waveform, the period of marked "A" is provided the output drive pulse, and the inclination of waveform is determined by the time constant of, R926 and C924, R937 and C929. The period of marked "B" is not provided the output drive pulse, and the inclination of waveform is determined by the time constant of, R925 and C924, R938 and C929.

(8) The operation of power on / off of sub-switch is performed to flow the current to 5 pin of IC909 which is controlled by the signal from micro computer (IC211).

(9) The zener diode D911 and D913 are equipped to work as a protection of over voltage.
If the voltage of C919 or C921 is higher, and exceeds the zener voltage (27V) of D911 or D913 at the abnormal condition, the zener diode is turned on, then the voltage is fed to 4 pin of IC908 or 6 pin of IC905 through the zener diode. When the voltage of 4 pin of IC908 or 6 pin of IC909 exceeds 2V, the drive
pulse from the switching regulator circuit is stopped as the protection of over voltage.
Once protection circuit operates, protection status is held till the power off.

(10) If the current flows to Q902 and Q903, or Q901, is increased at the over load condition, it makes a voltage drop of both the end of R916 or R920. When the voltage of 13 pin of IC908 or 15 pin of IC909 reaches 200mV, internal over current protector works to control the switching current of regulator.

2) SECONDARY RECTIFYING AND SMOOTHING CIRCUIT

(1) The magnetic energy is accumulated in the primary winding of T901 and T902 in the primary circuit during the turn on period of Q902 and Q903, or Q901, which transfers to the secondary and third windings during the turn off period of Q902 and Q903, or Q901.

(2) The induced voltage in the secondary and third winding is generated 9, 12, 13, 14 and 15 pin of T901, or 11, 12, 13, 14, 16, 17 and 18 pin of T902 as an AC pulse during the turn off period of Q902 and Q903, or Q901.
These voltages are rectified by D919~D922 (T901), or D923~D929, D930, 931, 939 (T902), and provide to the power supply lines.

2.3-5 HIGH VOLTAGE CIRCUIT

1) HIGH VOLTAGE SUPPLY AND CONTROL CIRCUIT

(1) The principle of high voltage supply circuit is basically same as the horizontal deflection.

(2) The drive pulse (HD) which is same as the horizontal deflection circuit, drives output FETs Q703 and Q704. The output FETs Q703 and Q704 provide the pulse during turn off period, which is stepped up to approx. 29.0KV by the flyback transformer (T701) for the anode voltage of CRT.

(3) To stabilize the high voltage in wide frequency range, the power supply voltage of high voltage circuit should be controlled by IC703 and Q702, and which circuits are controlled by the output signal (HA) from D/A convertor.

(4) The high voltage is already set to the pre-arranged value (29.0KV STD) by the output from micro computer (IC211) via Q713.

(5) The high voltage should be stabilized by T702 which is controlled by IC706(shunt regulator) and Q712. The proportional high voltage is fed to pin R of IC706. If the high voltage increases, the output voltage of pin K of IC706 decreases. The DC level of pulse made by a coil between pin 2 and pin k of T701 decreases.
If raises up the thresh hold level of gate voltage of Q712 relatively.
If makes the high voltage decrease to the correct value.
If the high voltage decreases, stabilized circuit works opposite direction 0 increase as above mentioned.

2) HIGH VOLTAGE SAFETY CIRCUIT

- CAUTION -
Safety circuit described below are equipped to prevent abnormal increase of the high voltage that may cause a X-ray radiation of harmful level.
No modification should be applied to the high voltage supply and safety circuits.

The safety circuit works as the over voltage protector for the high voltage.
The maycause a X-radiation of harm full level.

(1) No modification should be applied to the high Voltage supply and safety circuits. The safety circuit works as the over voltage protector for a Leigh Voltage.
(2) Excessive high Voltage is detected by R758 which is fed to hold-Down circuit. the Voltage across the capacit or C735, C736 which is proportional to the high Voltage is fed to Hold-Down circuit through R713, VR701 and R770. When high Voltage reaches 33kV the Voltage across D711 is over 6.0V and then IC702 goes to turn on, and Drain of IC701 is connected to the secondary ground Via TH701. Whe this happens, horizontal oscillation signal can no longer drive IC701, Q703 and Q704, so high Voltage goes down.
Once Hold-Down circuit operates, hold-down status is held till power is off.
Additionally, in case of T702 generates too high Voltage across C717, D715 becomes on to enable high Voltage protection circuit.

2.3-6 ABL CIRCUIT
(1) The ABL (Automatic Beam Current Limitter) circuit is for limiting the beam current of CRT.
(2) The brightness of CRT is determined by the beam current. The beam current is provided from 12V line of 17 pin of T902, and is detected by R737 and R769.
(3) If the beam current exceeds the limit value, the voltage drop of R737 and R769 increases, so the base voltage of Q218 decreases, so that the voltage of 4 pin of IC2R1, IC2G1, IC2B1 which controlls the gain of pre-amplifiers, is reduced.
It means that these circuts suppress the output of pre-amplifiers for limiting the brightness of CRT.

2.3-7 DC FAN CONTROL CIRCUIT
(1) This monitor is equipped two electrical fans which are located on the bottom of monitor and lower side of deflection yoke for cooling.
(2) The power supply for the DC fan is provided from 12VDC output 0f IC912 through R975.
(3) The current flows to DC fan is converted to voltage by electrical potentiometer (IC917) which is compared with reference voltage of R968 ~ R970 by the comparator (IC915).
(4) The output from IC917 is in the proper value, and IC918 provides unstable pulse at normal operation.
(5) If DC fan is stopped at abnormal condition, the output from IC917 exceeds pre-arranged value and then the output voltage from IC918 maintains high level DC signal. So the high level DC signal is fed to the micro computer (IC211) as the alarm signal, so that the micro computer provides the power off signal as the protection function to the power supply circuit after approx. 40sec.
(6) If the connector "CP-11" is disconnected, the output voltage from IC916 also maintains high level DC signal, so that the micro computer provides the power off signal to the power supply circuit.
Once protection ciruit operates, the protection status is held after the problem is solved.

2.3-8 CANCEL COIL CIRCUIT

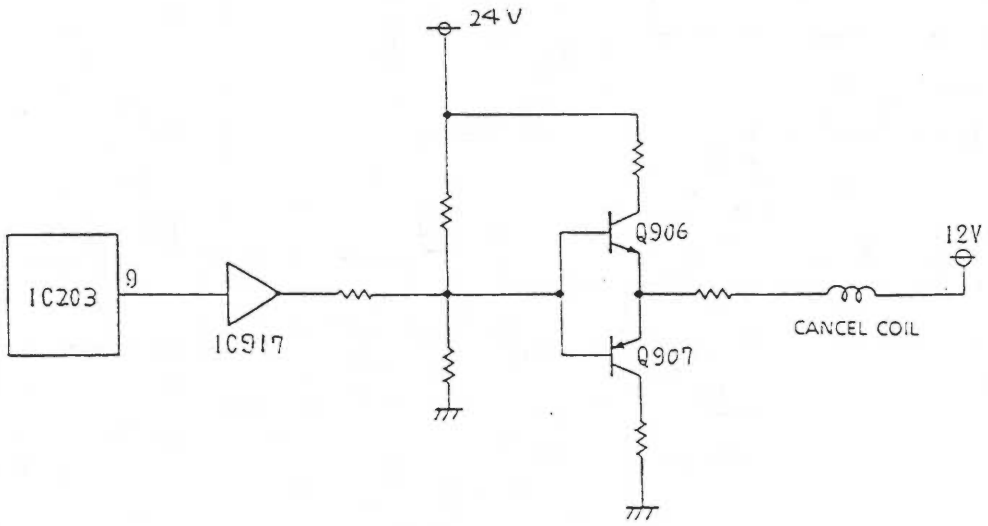
(1) Generally, the large size CRT is very sensitive against the environmental magnetic field such as earth magnetics in nature.

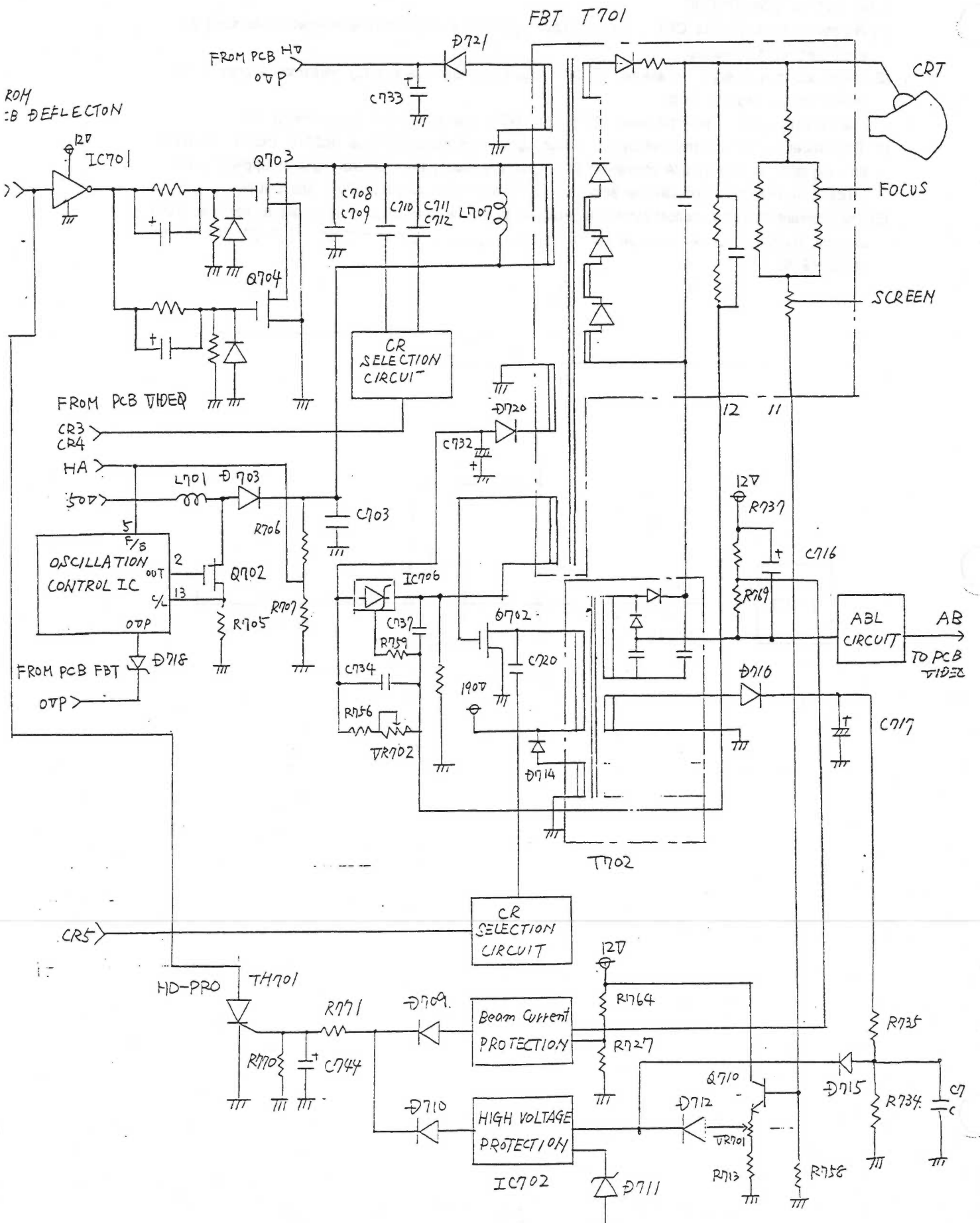
(2) The cancel coil is equipped around the CRT face to compensate a purity performance against the environmental magnetic field.

(3) The cancel current is provided from 12V or 24V DC power supply line to the cancel coil.

(4) The cancel current is controlled by the output signal from micro computer (IC211), and is converted from digital to analog by D/A convertor (IC203), so the analog level control signal is applied to the cancel coil through the operational amplifier (IC917) and buffer amplifier (Q906 and Q907).

(5) The different directions cancel current is provided to the cancel coil to compensate a north or south direction magnetic field which is performed by changing the output from Q906 and Q907, to 0～12V or 12～24V.





BLOCK DIAGRAM OF HIGH VOLTAGE C... OV HV PRO...TION CIRCUIT

2.4 VIDEO CIRCUIT

2.4-1 INPUT VIDEO SIGNAL

Input signal is available for two channels video signal(NTSC, M-NTSC, PAL, SECAM), two channels analog RGB video signal, which is shown as section 3.3 in specification.

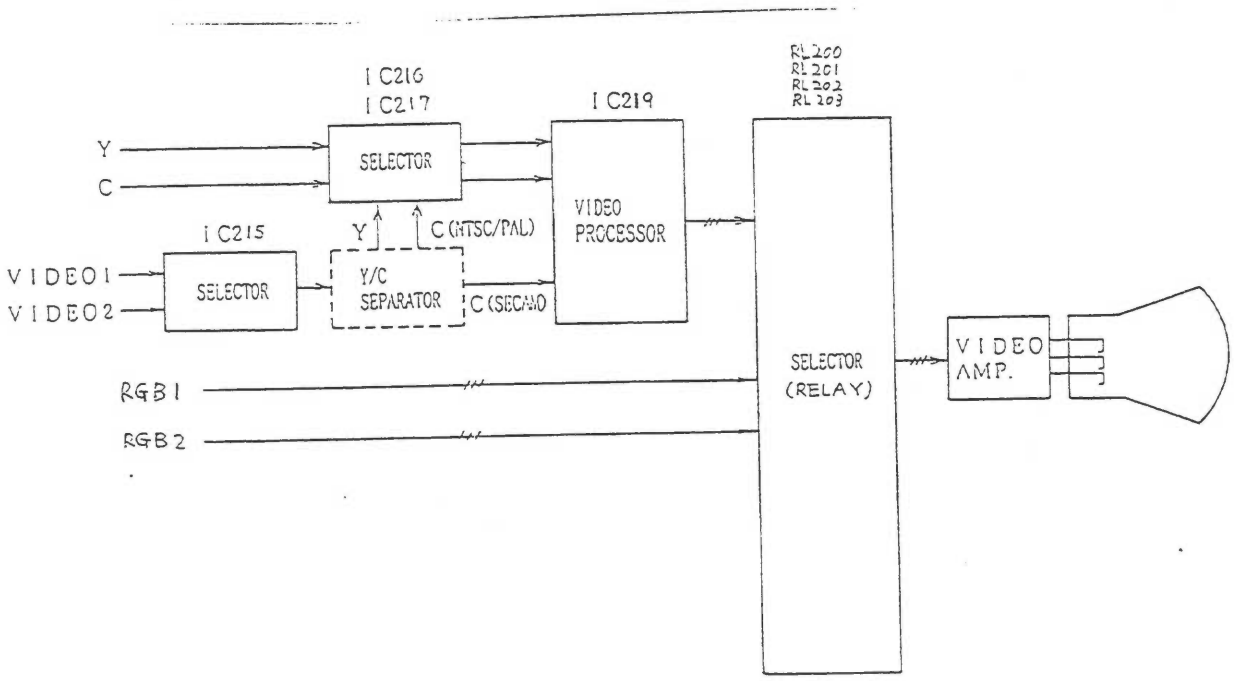
One of the two channels video signal can select the separated Y(brightness)/C(chromacity) video signal(S-VHS).

2.4-2 SELECTION OF INPUT SIGNAL

(1) Video 1 or 2 signal is selected by IC215, which signal or separated Y/C video signal is selected by IC216 and IC217, so that selected signal is applied to IC219 of video processing circuit.

IC219 provides the separated RGB primary video signal to relay of RL200 and RL201.

(2) RL200, RL201, RL202 and RL203 can select one channel RGB signal in three channel signals(one channel video, two channel analog RGB), which is applied to video amplifier circuit.



BLOCK DIAGRAM OF INPUT SIGNAL PROCESSING

2.4-3 VIDEO SIGNAL

(1) Video signal is applied from BNC connector or RCA jack on rear panel, which is terminated by 75Ω impedace in normal operation.

(2) When the monitor is used for loop through connection, the termination switch should select to "HIGH" impedance position with using T-coupler, then the final monitor should be selected to "75Ω" impedance position.

(3) Video signal is applied to analog switch of IC215 through the coupling.

2.4-4 VIDEO SIGNAL SELECTION

1) SOURCE SELECTION CIRCUIT

(1) The selection of VIDEO 1 or VIDEO 2, and AUDIO signal is performed by IC215 which is controlled by the output signal S1 and S0 form micro computer(IC211), and the operation of IC215 is as shown in below.

(2) The selection of S-VHS or composite signal in VIDEO 1 channel is performed by the selection switch S204 in the rear panel.

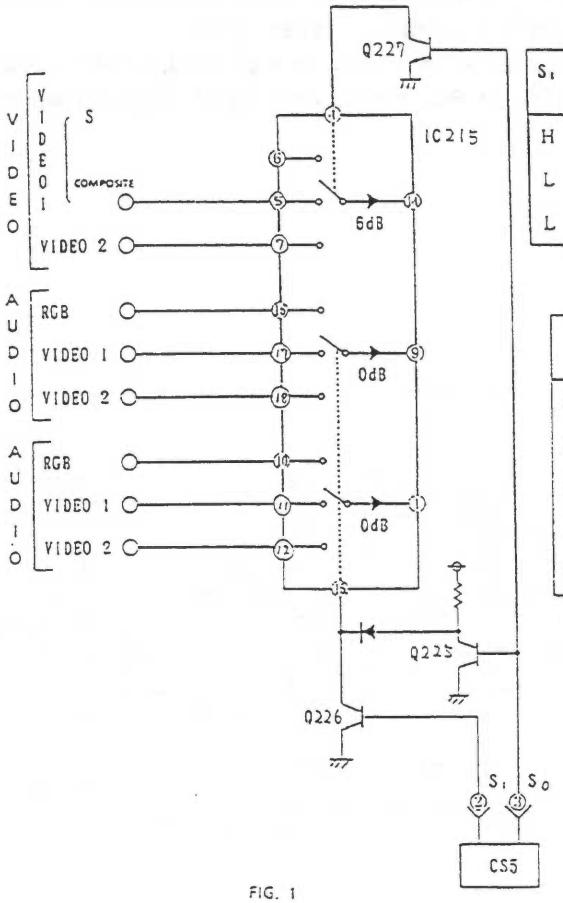


FIG. 1

OPERATION OF IC101

S1 S2	①	⑮	⑭ OUTPUT	①, ⑨ OUTPUT
H L	H	L	—	RGB
L H	L	OPEN	VIDEO 1	VIDEO 1
L L	OPEN	H	VIDEO 2	VIDEO 2

INPUT SIGNAL	SW 2	SW 3	IC104 ⑨	IC104 ⑩	INPUT TERMINAL
PAL	H	M	L	L	⑫ ① ⑬ ②
SECAM	M	M	L	L	↓ ↓
NTSC	L	M	L	H	⑭ ⑤
S入力	L	M	*	H	⑪ ④
B/W	M/L	L	L	L	⑫⑬①②

*…"HIGH" level at S-VHS selection of VIDEO 1

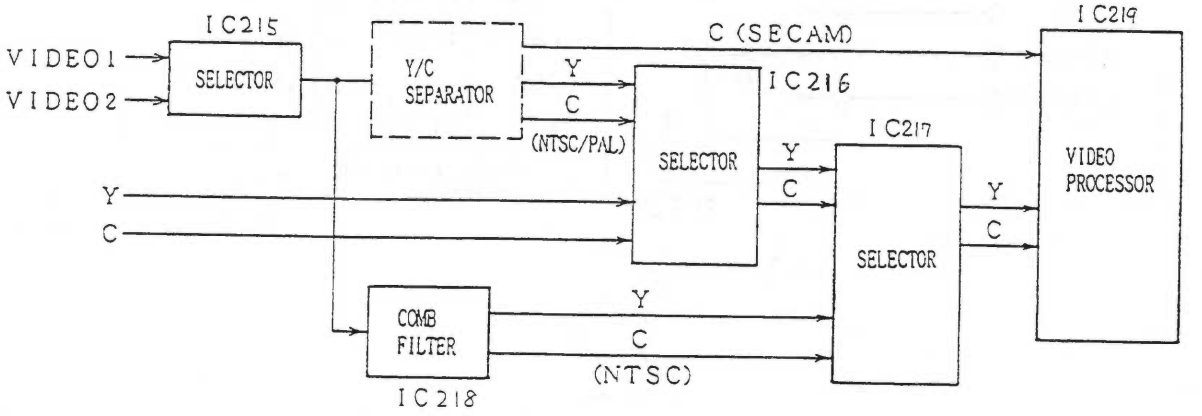
(3) The selected video signal is separated to Y(brightness) and C(chromacity) signal by paripheral circuit of IC219 which is show as below. (NTSC signal is applied to comb filter circuit of IC218.)
The separated Y/C signal or Y/C signal from S-terminal on rear panel is selected by IC216 which signal or separated Y/C signal by comb filter circuit is selected by IC217, then they are applied to IC219 of video processing circuit.
However, C signal of secam is directly applied to 18pin of IC219 after through the separator circuit.

(4) IC216 can select the signal from S-terminal when 9, 10 and 11pin of IC216 is "HIGH" level, and also select the separated Y/C signal from peripheral circuit of IC219 when 9, 10 and 11pin is "LOW" level.

(5) IC217 can select the signal from comb filter circuit when 9, 11pin is "HIGH" level, and also select the signal from IC216 when 9, 11pin is "LOW" level.

(6) The separated Y/C signal is applied to 20 and 58pin of IC219.
11pin of IC219 provides "HIGH" level signal when input 4.58MHz-NTSC, pal, and secam video signal, it also provides "LOW" level signal when input signal is 3.58MHz-NTSC video signal.
So, IC217 can select the video signal according to above input signal through Q243, Q244 and Q234.

(7) The Y/C signal is applied to IC219, which provides the RGB primary signal by 41, 42 and 43pin, then they are applied to relay of RL200 and RL201.



BLOCK DIAGRAM OF VIDEO SIGNAL PROCESSING CIRCUIT

2.5 ANALOG RGB SIGNAL

(1) The analog RGB input signal is provided from BNC or D-SUB connector on the rear panel.

(2) Normally, the termination of input signal is set to 75ohms impedance position by the selection switch on the rear panel. When some monitors are displayed with loop through connection, the selection switch should be set to high impedance position. The lower side of BNC connectors on the rear panel are used for the loop through connection, and the final connection monitor should be selected to 75ohms impedance position.

(3) The input signal of RGB 1 is provided to the relays RL202 and RL203 through the coupling capacitors C200, C201, C202, C203, C205, C206, and the buffers Q200, Q202, Q204, and the emitter followers Q201, Q203, Q205.

(4) The input signal of RGB 2 is provided to the relays RL200 and RL201 through the coupling capacitors C209 ~ C214, and the buffers Q212, Q210, Q208 and the emitter followers Q211, Q213, Q209.

2.6 INPUT SIGNAL SELECTION

The source selection signal is provided from IC211, and is applied to the relay drive transistor Q216 and Q217, then relay RL200 ~ RL203 select the following signal sources.

	VIDEO	RGB 1	RGB 2
Output of Q216	H	L	L
Output of Q217	H	H	L

2.7 CHARACTER DISPLAY

(1) The character signal on the screen is provided from IC220 and peripheral circuit by RGB primary signals which are applied to the analog switch IC225 on the PCB-VIDEO-SUB.

(2) The selection signal of character or video signal is applied to 9, 10, 11 pin of IC225 from IC205. The character signal is selected when the selection signal is "High" level, and the video signal is selected at "Low" level.

(3) To display the character on screen, the high speed selection signal (high and low signal) is applied to IC225, so that an overlapped display image is provided.

(4) After that, the overlapped character and video signal is applied from IC225 to relay RL2R1, RL2G1, RL2B1.

2.8 AMPLIFIER CIRCUIT

(1) The RGB signals selected by RL200 ~ RL203 are applied to the video amplifier IC2R1, IC2G1, IC2B1 through the coupling capacitor C2R1, C2R2, C2G1, C2G2, C2B1 and C2B2 on the PCB-VIDEO-SUB.

(2) The video processing IC, IC2R1, IC2G1, IC2B1 have the function of video signal control (11 pin; Drive control, 6 pin; Brightness control, 4 pin; Contrast control), and controlled signals are provided from 8.

(3) The video clamp pulse from clamp pulse generation circuit which is composed of IC210 and Q259, is fed to 5 pin of IC2R1, IC2G1, IC2B1 to clamp the black level of video signal.

(4) The video signals from IC2R1, IC2G1, IC2B1 are provided to the relay RL2R1, RL2G1, RL2B1 and analog switch IC225.

When display the overlapped image of video and character signals on the screen, the analog switch circuit is selected by the relays. When display only video signals, the video signals are provided to the main amplifiers circuit throughout the relays.

(5) The selection of character display or normal video signal is determined by the selection signal from the micro computer (IC211) to relay driver Q258.

	Normal video	Character displa
Output of Q258	H	L

(6) The video signals from relay RL2R1, RL2G1, RL2B1 are applied to the main-amplifiers circuit which is consisted by voltage a push-pull emiter follower which provide the cathode drive signals of CRT (approx. 60 ~ 80Vp-p at RGB input signal, approx. 120Vp-p at Video input signal).

(7) The amplified cathode drive signals are provided to the cathode of CRT after clamping the cathode level by the clamp circuit on the PCB-CRT.

(8) The clamp circuit provides DC voltage control function for the CRT cathode. When the collector currents of Q6R6, Q6G6 and Q6B6 become 0 (zero), the cathode voltage of D6R3, D6G3 and D6b3 become 190V, so that the maximum voltage of CRT cathode drive signals are maintained to 190V. When the collector currents of Q6R6, Q6G6 and Q6B6 are approx. 0.7mA, the cathode voltage of D6R3, D6G3 and D6B3 become 220V, so that the maximum voltage of CRT cathode drive signals are maintained to 220V.

2.9 SYNC. SIGNAL CIRCUIT

2.9-1 Input sync. signal

This monitor is available to input the following sync. signals;

(1) Horizontal / Vertical separate sync. signal: 0.3 ~ 4Vp-p and TTL, Positive / Negative polarity

(2) Horizontal / Vertical composite sync. signal: 0.3 ~ 4Vp-p and TTL, Positive / Negative polarity

(3) Sync. on green sync. signal: 0.3V (only sync. signal), Negative polarity

2.9-2 Video signal

(1) The video signal, selected by IC215, is applied to 33 pin of IC219 for the sync. signal separation, so the horizontal sync. signal is provided from 39 pin, and the vertical sync. signal is provided from 29 pin of IC219.

(2) The horizontal sync. signal is applied to 2 and 4 pin of IC206.

(3) The vertical sync. signal is applied to 11 pin and 15 pin of IC206 .

2.9-3 RGB 1 sync. signal

(1) The sync. signal for RGB 1 is available to input the Horizontal / Vertical separate sync. signal, Horizontal / Vertical composite sync. signal and sync. on green signal.

(2) The sync. signal is provided from the BNC connector on the rear panel and is selectable for the termination of "75ohms" or "High" position by the selection switch.

(3) The Horizontal separate sync. signal or Horizontal / Vertical composite sync. signal is applied to 1 pin of IC206 through the coupling capacitor C207, buffer Q206 and S206.

(4) The Vertical sync. signal is applied to 12 pin of IC206 through the coupling capacitor C208 and buffer Q207.

(5) The sync. on green signal is applied to 6 pin of IC210 through the coupling capacitor C204, emitter follower Q219.

2.9-4 RGB 2 sync. signal

(1) The sync. signal for RGB 2 is available to input the Horizontal / Vertical separate sync. signal, Horizontal / Vertical composite sync. signal.

(2) The selection of termination of "75ohms" or "High" is available by selection of pin assignment in the connector.

(3) The Horizontal separate sync. signal or Horizontal / Vertical composite sync. signal is applied to 5 pin of IC206 through the coupling capacitors C217, C218 and buffer Q215.

(4) The Vertical sync. signal is applied to 14 pin of IC206 through the coupling capacitors C215, C216 and buffer Q214.

2.9-5 Selection of Sync. Signal

(1) The selection of sync. signal is performed by the analog switch IC206.

(2) The selectioin of input signal is performed by the micro computer IC211, the output signal from 28 and 29 pin of IC211 is applied to 9 and 10 pin of IC206 through Q220 and Q221 for the signal selection.

(3) The output signal from IC206 for the input selection is as follows.

IC206	Video	RGB 1	RGB 2
9 pin	H	L	L
10 pin	×	L	H

H: 12V
L: 0V
×: H or L

2.9-6 Sync. Signal Detection and Separation

(1) The Horizontal separate sync. signal or Horizontal/Vertical composite sync. signal which is selected by the analog switch IC206 is applied to 9pin of IC210 through C242.

(2) The Vertical sync. signal which is selected by the analog switch IC206 is applied to 11pin of IC210 through C241.

(3) The separated horizontal sync. signal is provided from 25pin of IC210, the vertical sync. signal is provided form 21pin of IC210, as a drive pulse for the deflection circuit.

2.10 MICRO COMPUTER AND PERIPHERAL CIRCUIT

2.10-1 Function of Micro Computer

1) This monitor is equipped 8bits micro computer which has the following functions;

(1) Power on / off control

(2) Discrimination of Horizontal / Vertical frequency

(3) C_S, C_R, etc. selection signal control

(4) Source and mode selection control

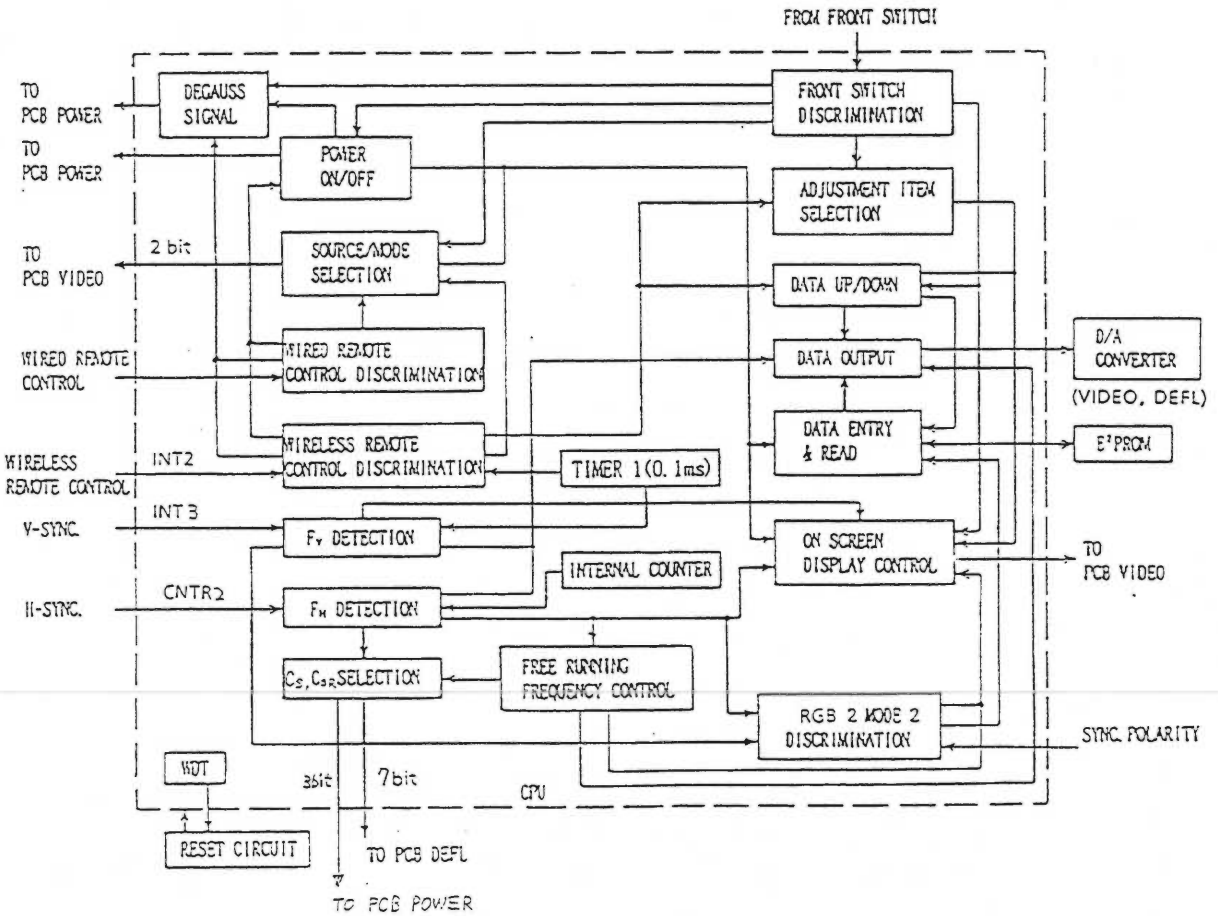
(5) Discrimination of wireless remote control signal

(6) D/A convertor control

(7) Read and write operation to E^2PROM

(8) On screen display control

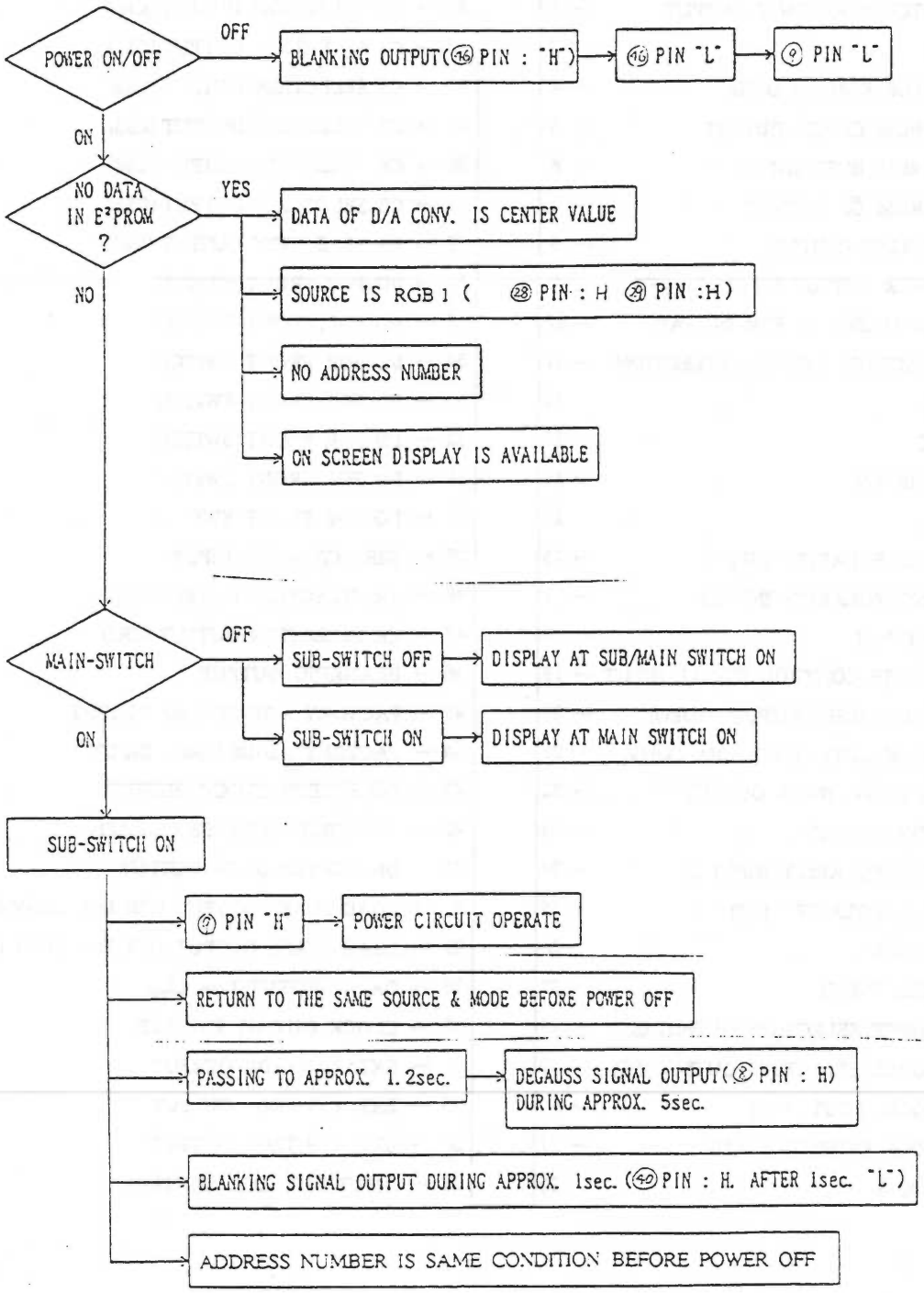
2) Internal Block Diagram of Micro Computer



PIN ASSIGNMENT & I/O OF MPU

	PIN NO.		PIN NO.	
Vcc(5V)	1		64	→ CR SELECTION OUTPUT (CR5)
WATCH DOG TIMER OUTPUT	← 2		63	→ CR SELECTION OUTPUT (CR4)
N. C	3		62	→ CS SELECTION OUTPUT (CS1)
I/P FOR E^2PROM DATA	↔ 4		61	→ CS SELECTION OUTPUT (CS2)
E^2PROM CLOCK OUTPUT	← 5		60	→ CS SELECTION OUTPUT (CS3)
E^2PROM BUSY INPUT	→ 6		59	→ CS SELECTION OUTPUT (CS4)
E^2PROM $\overline{CS}$ OUTPUT	← 7		58	→ CS SELECTION OUTPUT (CS5)
DEGAUSS OUTPUT	← 8		57	→ CR SELECTION OUTPUT (CR1)
POWER OUTPUT (H : ON, L : OFF)	← 9		56	→ I/O FOR FRONT SWITCH
ALARM SIGNAL FOR DC FAN	→ 10		55	→ I/O FOR FRONT SWITCH
ON SCREEN DISPLAY SELECTION	← 11		54	→ I/O FOR FRONT SWITCH
N. C	12		53	← I/O FOR FRONT SWITCH
N. C	13		52	← I/O FOR FRONT SWITCH
HD INPUT	→ 14		51	← I/O FOR FRONT SWITCH
N. C	15		50	← I/O FOR FRONT SWITCH
SYNC. POLARITY INPUT4	→ 16		49	← SERVICE MODE INPUT
SYNC. POLARITY INPUT3	→ 17		48	→ CR SELECTION OUTPUT (CR2)
VD INPUT	→ 18		47	→ CR SELECTION OUTPUT (CR3)
REMOTE CONTROL SIGNAL INPUT	→ 19		46	→ BLANKING OUTPUT
LOAD PULSE OUTPUT (VIDEO)	← 20		45	→ FACTORY ADJUST (Ack) OUTPUT
CLOCK OUTPUT FOR D/A CONV.	← 21		44	← FACTORY ADJUST (Ack) INPUT
D/A CONV. DATA OUTPUT	← 22		43	→ ON SCREEN CLOCK OUTPUT
MUTE OUTPUT	← 23		42	→ ON SCREEN STROBE OUTPUT
SYNC. POLARITY INPUT 2	→ 24		41	→ ON SCREEN DATA OUTPUT
SYNC. POLARITY INPUT 1	→ 25		40	→ LOAD PULSE OUTPUT FOR D/A CONV (DEFL2)
CNVss (0V)	26		39	→ LOAD PULSE OUTPUT FOR D/A CONV (DEFL1)
RESET INPUT	→ 27		38	→ DATA OUTPUT FOR LED
SOURCE SELECTION OUTPUT (SS0)	← 28		37	→ CLOCK OUTPUT FOR LED
SOURCE SELECTION OUTPUT (SS1)	← 29		36	→ EXT. CONTROL OUTPUT
CLOCK INPUT (×IN)	→ 30		35	→ EXT. CONTROL OUTPUT
CLOCK OUTPUT (×OUT)	← 31		34	→ EXT. CONTROL OUTPUT
Vss (0V)	32		33	← INPUT FOR EXT. CONTROL

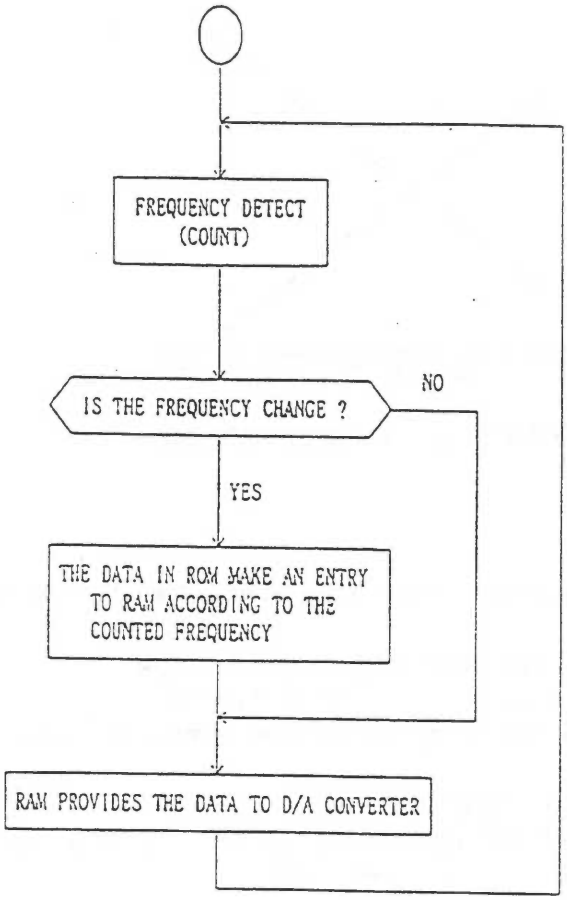
2.10-2 Flow Chart of Power On / Off


POWER ON/OFF
OFF
BLANKING OUTPUT(⑯ PIN : "H")
⑯ PIN "L"
⑨ PIN "L"
ON
NO DATA IN E²PROM ?
YES
DATA OF D/A CONV. IS CENTER VALUE
SOURCE IS RGB 1 (㉘ PIN : H ㉙ PIN :H)
NO ADDRESS NUMBER
ON SCREEN DISPLAY IS AVAILABLE
NO
MAIN-SWITCH
OFF
SUB-SWITCH OFF
DISPLAY AT SUB/MAIN SWITCH ON
ON
SUB-SWITCH ON
DISPLAY AT MAIN SWITCH ON
SUB-SWITCH ON
⑦ PIN "H"
POWER CIRCUIT OPERATE
RETURN TO THE SAME SOURCE & MODE BEFORE POWER OFF
PASSING TO APPROX. 1.2sec.
DEGAUSS SIGNAL OUTPUT(② PIN : H) DURING APPROX. 5sec.
BLANKING SIGNAL OUTPUT DURING APPROX. 1sec. (㊵ PIN : H. AFTER 1sec. "L")
ADDRESS NUMBER IS SAME CONDITION BEFORE POWER OFF

2.10-3 Horizontal / Vertical Frequency Detection and Selection Signal

1) Flow Chart of Frequency Detection

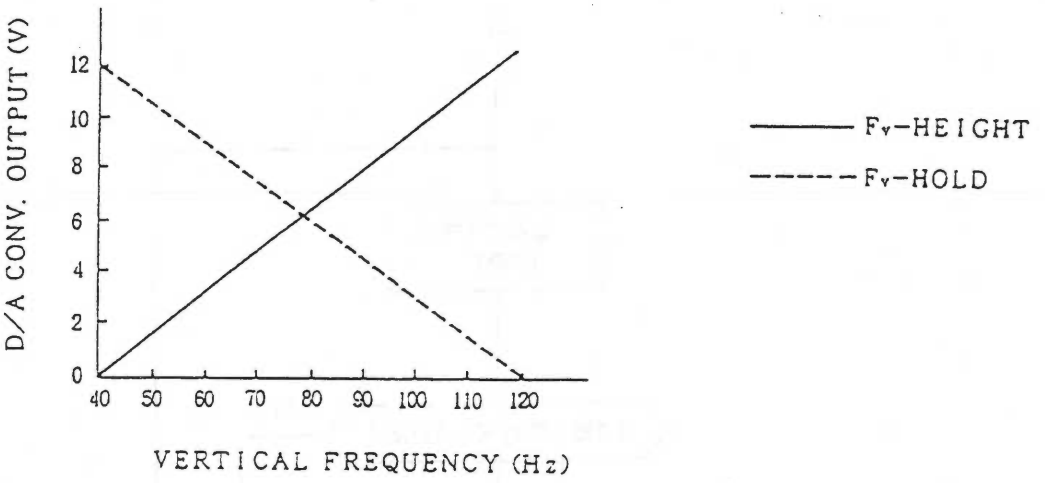
To stabilize the operation of internal circuit in wide frequency range, detection of frequency is performed by the micro computer (IC211) according to the following procedure.



2) Vertical Frequency (Fv) Detection

(1) The vertical sync. signal is applied to 18 pin (INT3) of IC211 and is detected by the count number of internal counter (0.1ms) during one period of vertical sync. signal.

(2) The relation of output voltage of D/A convertor vs. vertical frequency is as shown in below, to give the compensation of vertical hold and vertical height control.



(3) Fv-HOLD and Fv-HEIGHT control datas are selected by the data of ROM in IC211 according to the vertical frequency.

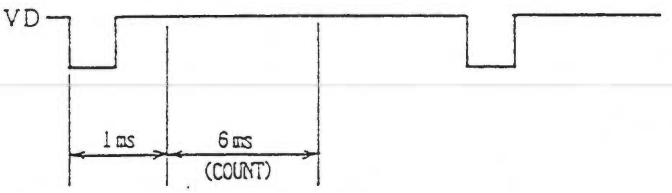
(4) The D/A convertor IC402 provides the following control signals.

11 pin : Fv-HOLD 10 pin : Fv-HEIGHT

(5) The detected vertical frequency by IC211 is used for the discrimination of limit frequency.

3) Horizontal Frequency (Fh) Detection

(1) The horizontal frequency (Fh) applied to 14 pin (CNTR1) of IC211, is detected by the count number of internal counter during 6ms as shown in below.

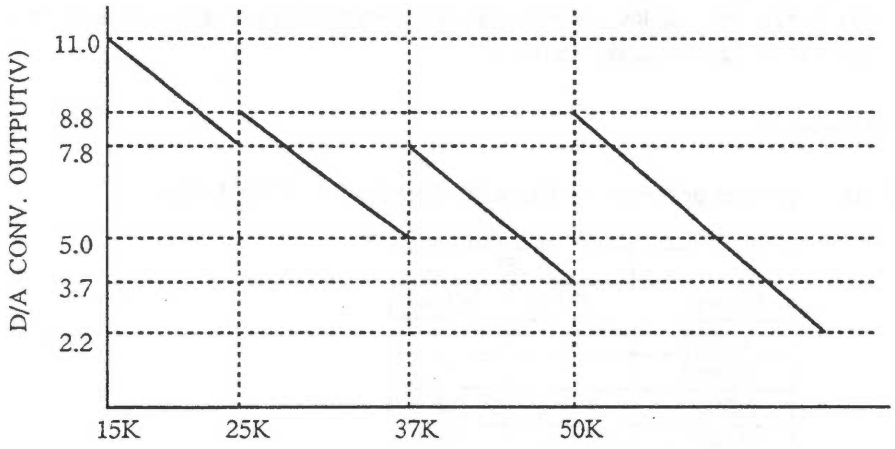


(2) The detected horizontal frequency is used for C_S selection, On screen display control and discrimination of limit frequency.

(3) The detected signal (HA) is provided from 14 pin of IC203 which signal is controlled by the micro computer IC211 according to the horizontal frequency.

(4) The signal of "HA" is used to compensate the power supply voltage of high voltage circuit should be controlled by IC703 and Q702 is optimized according to the horizontal frequency.

(5) The relation of horizontal frequency vs. output voltage of 14 pin of IC203 is as shown in below to give the compensation of drive condition of Q703, Q704.

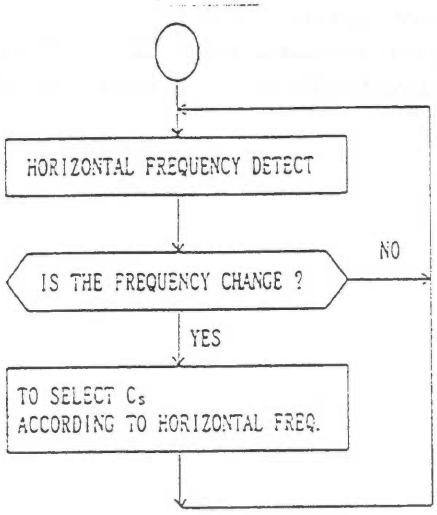


4) C_s Selection

(1) The selection of linearity compensation capacitor (C_s) is performed by output signal from 58 ~ 62 pin of IC211 which change the capacitance according to the horizontal frequency range as follows.

Horizontal Frequency (KHz)	IC211				
	62 Pin	61 Pin	60 Pin	59 Pin	58 pin
~ 20.0	L	L	L	L	L
20.0 ~ 25.0	H	L	L	L	L
25.0 ~ 30.0	H	L	L	L	H
30.0 ~ 32.2	H	L	H	L	L
32.2 ~ 37.0	H	L	L	H	H
37.0 ~ 44.0	H	L	H	H	L
44.0 ~ 51.0	H	L	H	H	H
51.0 ~ 61.0	H	H	L	H	H
61.0 ~ 71.0	H	H	H	H	L
71.0 ~	H	H	H	H	H

(2) Flow chart of C_s selection



5) Vertical Linearity (V-LIN.S) Control

(1) To compensate the vertical linearity, the output voltage from 9 pin of IC401 is controlled by the micro computer according to the vertical frequency.

(2) The output of IC401 is modulated by the parabolic waveform which is controlled to increase the output voltage by IC211 when the vertical frequency increases.

2.10-4 Source / Mode Selection

1) Source Selection

(1) The selection of input source is performed by the micro computer (IC211) as follows.

	IC211	
Source	28 pin	29 pin
Video 1	L	L
Video 2	H	L
RGB 1	H	H
RGB 2	L	H

(2) 46 pin of IC211 provides the blanking pulse during approx. 0.5 ~ 2sec. when change input sources.

2.10-5 Wireless Remote Controller

The wireless remote controller provides the following functions.

(1) Power ON / OFF (Sub-Switch)

(2) Selection of SOURCE / MODE

(3) Raster adjustment

(4) Address number entry and call (The address number means number of monitor at the multi-display.)

(5) Degauss ON

(6) Selection of composite sync. signal at RGB input

(7) On screen display call / clear

(8) On screen display ON / OFF (Display OFF is used for SOURCE or MODE.)

(9) Mute ON / OFF

2.10-6 D/A Convertor

1) The micro computer (IC211) provides the following signal to the D/A convertors.

(1) Data signals (22 pin)

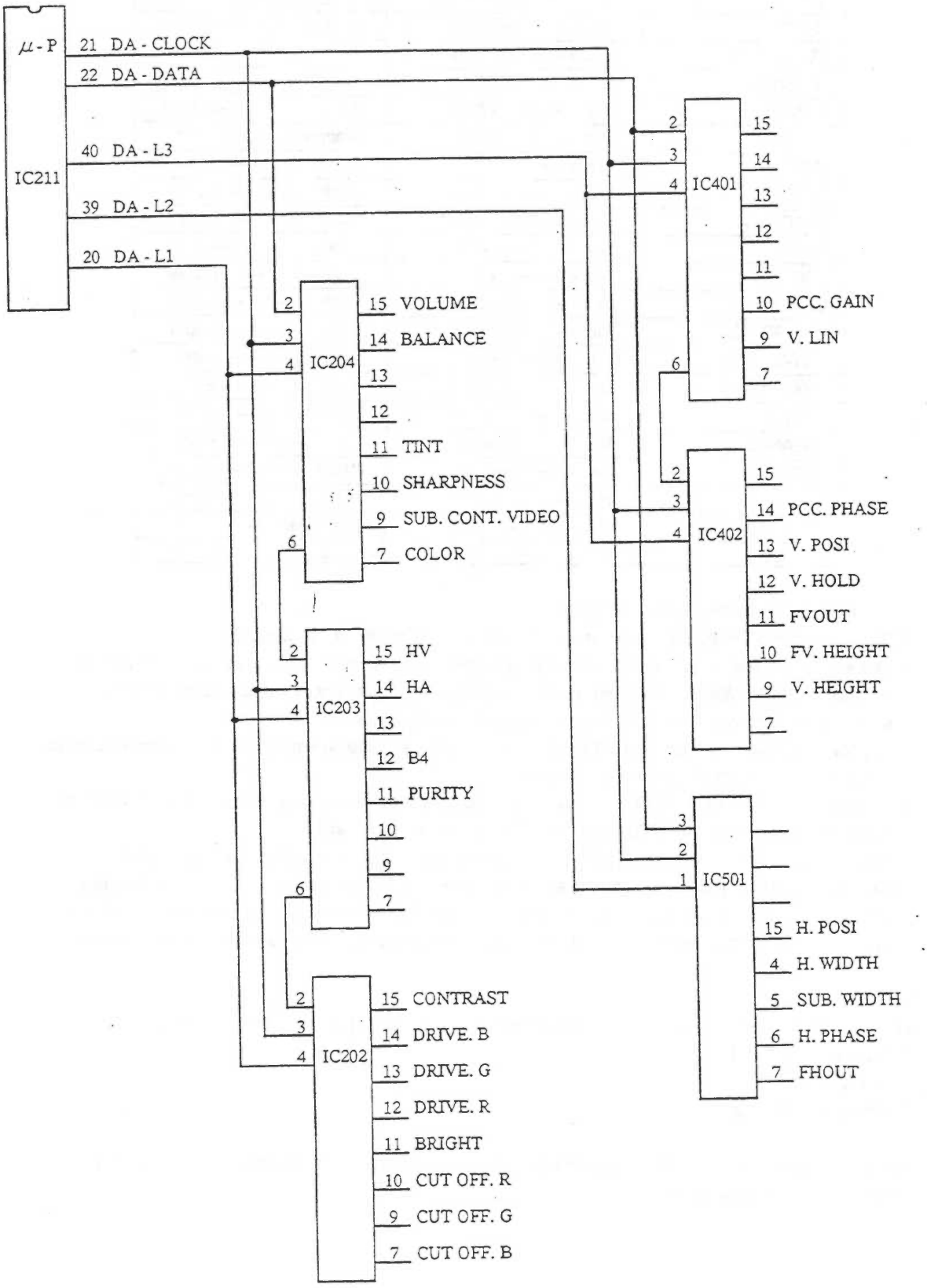
(2) Clock signals (21 pin)

(3) Load signals (20, 39, 40 pin)

2) The connection diagram and output signal is as follws.

3) The D/A convertors are composed to separate a pair of IC202, IC203 and IC204, a pair of IC401 and IC402 and IC501. The load signals for D/A convertors are provided every one cycle of main loop to each pair of connection.

4) The load signals for D/A convertors are provided from IC211, 20 pin is for IC202, IC203 and IC204, 39 pin is for IC501, 40 pin is for IC401 and IC402.



5) Relation of D/A conv. output vs. display condition

Item	D/A Data (Up<----->Down)	Display Condition
H-WIDTH	Inc. <----------> Dec.	Narrow <----------> Wide
SUB-WIDTH	Inc. <----------> Dec.	Narrow <----------> Wide
H-PHASE	Inc. <----------> Dec.	Left <----------> Right
H-POSI	Inc. <----------> Dec.	Left <----------> Right
V-HEIGHT	Inc. <----------> Dec.	Narrow <----------> Wide
V-POSI	Inc. <----------> Dec.	Down <----------> Up
BRIGHT	Dec. <----------> Inc.	Dark <----------> Light
CONTRAST	Dec. <----------> Inc.	Dark <----------> Light
COLOR	Dec. <----------> Inc.	Light <----------> Deep
TINT	Inc. <----------> Dec.	Red <----------> Green
CUT-OFF (R)	Inc. <----------> Dec.	Dark <----------> Light
CUT-OFF (G)	Inc. <----------> Dec.	Dark <----------> Light
CUT-OFF (B)	Inc. <----------> Dec.	Dark <----------> Light
SHARPNESS	Dec. <----------> Inc.	Soft <----------> Sharp
VOLUME	Dec. <----------> Inc.	Small <----------> Loud
BALANCE	Dec. <----------> Inc.	Left <----------> Right
PURITY	Dec. <----------> Inc.	North <----------> South
B4	Inc. <----------> Dec.	Volt. Dec. <--------> Inc.
HIGH VOLTAGE	Dec. <----------> Inc.	Volt. Dec. <--------> Inc.
V-HOLD	Inc. <----------> Dec.	Freq. Dec. <-------> Inc.

2.10-7 Read or Write Operation of E^2PROM

(1) Basically, the optimum display datas are memorized in E^2PROM in the factory.

(2) In case of no data in E^2PROM, the monitor displays raster according to the flow chart stated in

(3) In case of RGB (USER MODE), the adjustment datas are automatically memorized to E^2PROM when operates to push the buttons on front panel or wireless remote controller.
So, the datas are maintained in E^2PROM after turn off the power switch or select the other sources or modes. (The other Modes are not available.)

(4) In case of VIDEO / RGB (PRESET MODE), the adjustment datas are only memorized in E^2PROM to push the both buttons of " DEGAUSS " and " VOL " at the same time.
(The monitor displays " MEMORIZED " on the screen when adjustment datas are memorized.)

(5) Normally, adjustment items are displayed on the screen when push the front buttons or wireless remote controller. If the further adjustment will be needed (for example, high volt. or B4 volt. etc.), the switch S209 on video PCB should be set to properly position. (Please refer to adjust. section)

2.10-8 On Screen Display

IC220 for on screen character display, is provided the following signals from micro computer IC211.

(1) Data signal (41 pin)

(2) Clock signal (43 Pin)

(3) Strobe signal (42 pin)

The above signals are used to display the source, mode, adjustment item, adjustment value, and address number on the screen.

2.10-9 External Wired Remote Control

1) The external wired remote control provides the following functions.

(1) Selection of Ext. (wired remote control) / Int. (wireless remote controller or front buttons).

(2) Power ON /OFF *

(3) Source selection *

(4) Degauss ON / OFF *

* These functions are only available to select the Ext.

2) Signal discrimination and selection

(1) The selection signals as shown in below are determined by the cmbination of, selection signal from 34 ~ 36 pin of IC211 to data selector IC201 and output signal from IC201 to 33 pin of IC211.

(2) The pin assignment of IC201 is as follows.

IC201	Level	Selection Signal	
13 pin	L	External	
	H	Internal	
12 pin	L	Power ON	*
	H	Power OFF	*
4 pin	L	Video 1	*
3 pin	L	Video 2	*
2 pin	L	RGB 1	*
1 pin	L	RGB 2	*
15 pin	L	Degauss	*

* These items are only available to select the external signal.

(3) The priority of source selection is as follows.

Video 1 > Video 2 > RGB 1 > RGB 2

(4) If all terminals for source selection signal become "High" level at the same time, the previous source is available.

(5) The wireless remote controller, and sub power switch and source selection buttons are not functioned when select the Ext. signal.

3. ADJUSTMENT

3.1 GENERAL

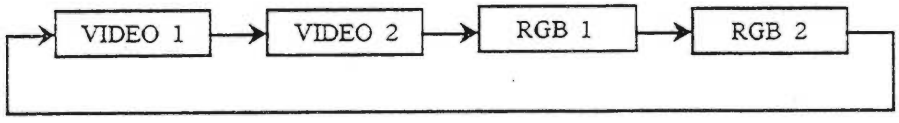
3.1-1 USER CONTROL

1) Push Switch

Remote / Front	Switch	Purpose
Wierless Remote Controller	POWER	Sub Power Switch ON / OFF
	VIDEO 1	Source Selection
	VIDEO 2	Source Selection
	RGB 1	Source Selection
	RGB 2	Source Selection
	BRIGHT	Brightness Control Select, Adjustable by Up / Down SW
	CONTRAST	Contrast Control Select, Adjustable by Up / Down SW
	VOLUME	Speaker Sound Control Select, Adjustable by Up / Down SW
	BALANCE	Speaker Balance Control Select, Adjustable by Up / Down SW
	SET	Adjustment Item Select (Refer to the next section)
	UP / DOWN	Adjustment Value Control
	Ten Keys	Address Number and Adjustment Item Set Up
	ENTER	Number and Data Entry
	DEGAUSS	To Operate the Manual Degauss during Approx. 5sec.
	CALL / CLEAR	Address, Source / Mode display call / clear
	MUTE	Mute Function ON / OFF
Front Panel	POWER	Sub Power Switch ON / OFF
	SOURCE	Source Selection (Refer to the next section)
	CONTRAST	Contrast Control Select, Adjustable by Up / Down SW
	VOLUME	Speaker Sound Control Select, Adjustable by Up / Down SW
	SET	Adjustment Item Select (Refer to the next section)
	UP / DOWN	Adjustment Value Control
	DEGAUSS	To Operate the Manual Degauss during Approx. 5sec.

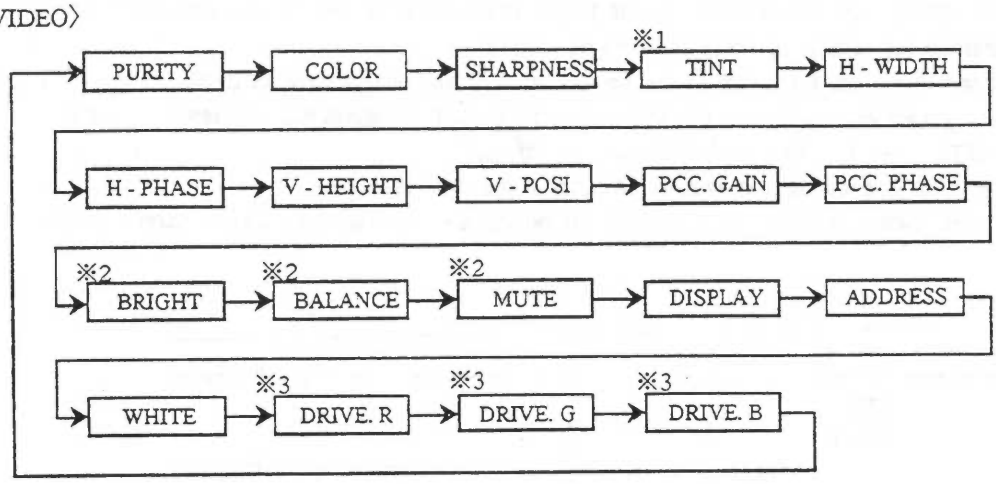
2) Source and Adjustment Item Selection

(1) The input sources can be selected when push the " SOURCE " switch on the front panel as follows.

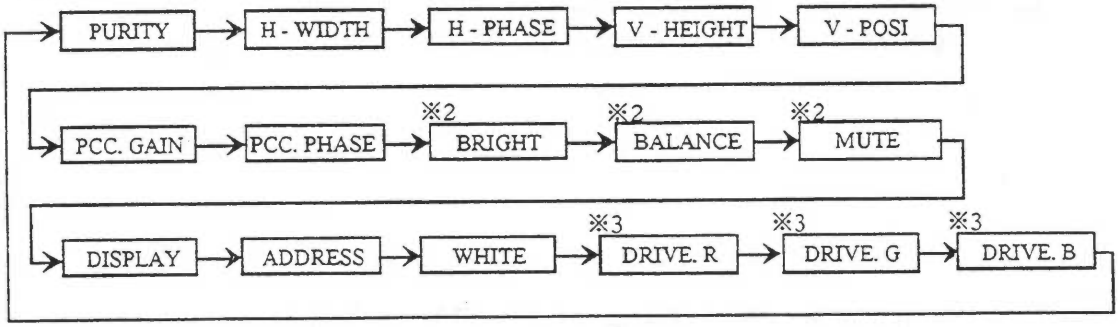


(2) The adjustment items can be selected when push the "SET" switch on the front panel or wireless remote controller as follows.

〈VIDEO〉



〈RGB〉



※1 : NTSC
※2 : ONLY FRONT "SET"
※3 : WHITE "USER"

(3) Adjustment Item

(3)-1 PURITY : Cancel coil current adjustment to compensate the color purity
(3)-2 COLOR : Light or deep control of color
(3)-3 SHARPNESS : Sharp or soft control of picture
(3)-4 TINT : Color tone control
(3)-5 H-WIDTH : Horizontal raster size control
(3)-6 H-PHASE : Horizontal raster position control
(3)-7 V-HEIGHT : Vertical raster size control
(3)-8 V-POSI : Vertical raster size control
(3)-9 DISPLAY : Source or Mode ON / OFF
(3)-10 ADDRESS : Address number set up for the multi display

If remote inop check "Address" setting ; should be "0"

3.1-2 INTERNAL ADJUSTMENT

1) Access to internal Adjustment – supply video input

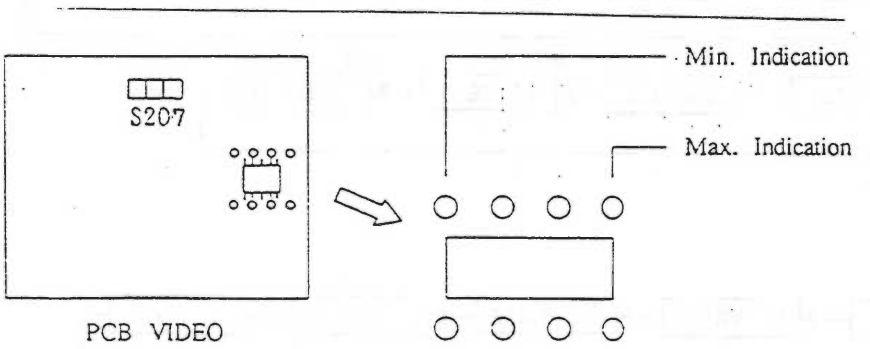
(1) Normally, adjustment items are displayed on the screen when push the switches on the front panel or wireless remote controller. However, if the further adjustments will be needed, internal switch of S207 on the VIDEO PCB should be set to the proper position for the internal adjustments, which works to change the function of front switches as follows.

(2) The adjustment items are displayed on the screen when change the position of S207. to center position

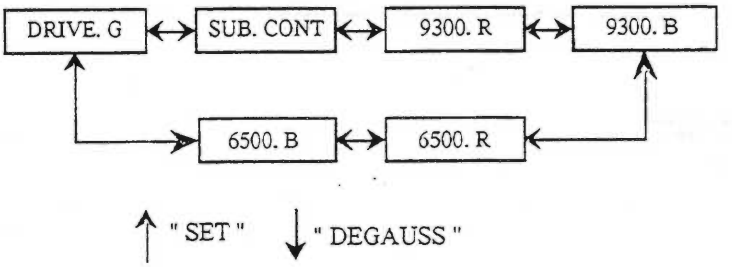
(3) The adjustment item change by pushing the front swith of SET or DEGAUSS and remote control swicth of SET. – + keys to change setting

(4) The PRESET NO is a adjustment item to memorize preset frequency dates.

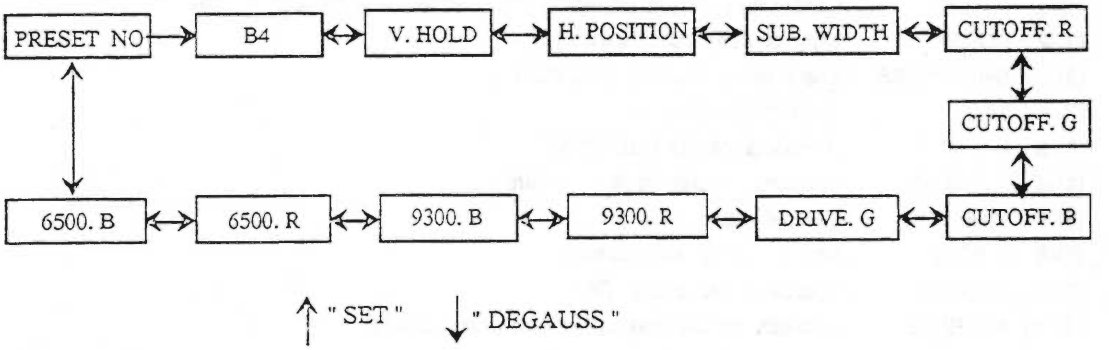
(5) When the front switch of VOLUME is pushed, the adjustment item displayed on the screen erase.



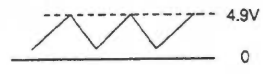
〈VIDEO〉



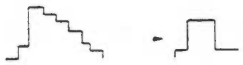
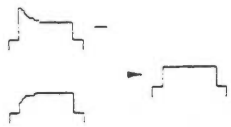
〈RGB〉



3.2 Adjustment Procedure

No.	ADJUST. ITEM	INPUT SIGNAL		SOURCE	CONDITION	A:Direction of S207	ADJUSTMENT
		TIMING	PATTERN				
1	B4	VGA480 (#5)	No Video	RGB 1	CONT : Max. BRT : 0	A : → : or ←	Adjust the voltage of C937+side(PCB POWER) for a 50.0±0.5V by UP/DOWN switch
2	H-HOLD 1	Freerun	Cross hatch	RGB 1	CONT : Max. BRT : 0	-	Adjust VR501 to get 35.5k± 0.2kHz at TP-1(PCB DEFL)
3	H-HOLD	SGI82K NTSC	Cross hatch	RGB 1	CONT : Max. BRT : 0	-	Only confirmation of synchronization
4	V-HOLD	VGA480 (#5)	Cross hatch	RGB 1	CONT : Max. BRT : 0	A : → : or ←	Adjust the waveform on TP-3 for a 4.9±0.1V by UP/ DOWN switch 
5	X-ray-Protection	VGA480 (#5)	No Video	RGB 1	CONT : Max. BRT : 0	-	(1) Turn the SCREEN VR full left side (2) Turn the VR701(PCB-HV) full left side (3) Adjust the anode voltage for a 33kV (4) Adjust the VR701 at anode voltage down point (5) Cover the DHHS CAP over the VR701 the adhesive is a TSE3940
6	High Voltage	VGA480 (#5)	Cross hatch	RGB 1	CONT : Max. BRT : 0	-	Adjust the anode voltage for a 29.0±0.3KV by VR702 PCB-FBT)
7	H-POSI	f_H=45KHz (#14)	No Video	RGB 1	Adjust the BRIGHT and SCREEN cintrol to appear a back ground.	A : ← : or →	Adjust the back raster to center of CRT by UP/ DOWN switch
8	SUB-WIDTH	XGAII (#18)	Full white Raster	RGB 1	CONT : Max. BRT : 0	A : → : or ←	Adjust the horizontal width for a 500±5mm by UP/ DOWN switch
9	FOCUS	VGA480 (#5)	Cross hatch	RGB 1	CONT : Max. BRT : 0	-	Adjust the focus by FOCUS potentiometers on FBT.
10	CUT-OFF	VGA480 (#5)	No Video	RGB 1	CONT : Max. BRT : 0	A : ← : or →	(1) Adjust the RGB Cut-Off control to their min. values. (2) Adjust the screen control to get the slight screen (3) Adjust the RGB Cut-Off control to get a white screen.
11	DRIVE	VGA480 (#5)	Green Window	RGB 1	CONT : Max. BRT : 0	A : ← : or →	Adjust the brightness of green color for a 160nits
12	WHITE BALANCE 9300R, B 6500R, B	VGA480 (#5)	White Window	RGB 1	CONT : Max. BRT : 0	A : ← : or →	Adjust the white balance as follows by UP/DOWN switch 9300···X=0.283 Y=0.297 6500···X=0.313 Y=0.329

No.	ADJUST. ITEM	INPUT SIGNAL		SOURCE	CONDITION	A:Direction of S207	ADJUSTMENT
		TIMING	PATTERN				
13	RASTER SIZE and POSITION	VGA480 (#5)	Full Wite Raster	RGB 1	CONT : Max. BRT : 0	A : CENTER	Adjust the raster size as follows H-WIDTH : 500mm V-HEIGHT : 375mm
14	RASTER SIZE and POSITION	VGA400 (#4)	Full White Raster	RGB 1	CONT : Max. BRT : 0	A : CENTER	Adjust the raster size as follows H-WIDTH : 500mm V-HEIGHT : 375mm
15	RASTER SIZE and POSITION	MACII (#6)	Full White Raster	RGB 1	CONT : Max. BRT : 0	A : CENTER	Adjust the raster size as follows H-WIDTH : 500mm V-HEIGHT : 375mm
16	RASTER SIZE and POSITION	SVGA72 (#17)	Full White Raster	RGB 1	CONT : Max. BRT : 0	A : CENTER	Adjust the raster size as follows H-WIDTH : 500mm V-HEIGHT : 375mm
17	RASTER SIZE and POSITION	XGA(#12)	Full White Raster	RGB 1	CONT : Max. BRT : 0	A : CENTER	Adjust the raster size as follows H-WIDTH : 500mm V-HEIGHT : 375mm
18	RASTER SIZE and POSITION	XGAII (#18)	Full white Raster	RGB 1	CONT : Max. BRT : 0	A : CENTER	Adjust the raster size as follows H-WIDTH : 500mm V-HEIGHT : 375mm
19	RASTER SIZE and POSITION	SMACII (#19)	Full White Raster	RGB 1	CONT : Max. BRT : 0	A : CENTER	Adjust the raster size as follows H-WIDTH : 500mm V-HEIGHT : 375mm
20	RASTER SIZE and POSITION	SUN 71K (#20)	Full White Raster	RGB 1	CONT : Max. BRT : 0	A : CENTER	Adjust the raster size as follows H-WIDTH : 500mm V-HEIGHT : 390mm
21	RASTER SIZE and POSITION	HP78K (#21)	Full White Raster	RGB 1	CONT : Max. BRT : 0	A : CENTER	Adjust the raster size as follows H-WIDTH : 500mm V-HEIGHT : 400mm
22	RASTER SIZE and POSITION	SGI 82K (#22)	Full White Raster	RGB 1	CONT : Max. BRT : 0	A : CENTER	Adjust the raster size as follows H-WIDTH : 500mm V-HEIGHT : 400mm
23	RASTER SIZE and POSITION	NTSC	Cross hatch	VIDEO 1	CONT : Max. BRT : 0	A : CENTER	Adjust the raster size for an over scanning
24	RASTER SIZE and POSITION	PAL/ SECAM	Cross hatch	VIDEO 1	CONT : Max. BRT : 0	A : CENTER	Adjust the raster size for an over scanning
25	COMB FILTER	NTSC	Color bar Chroma ON	VIDEO 1	-	-	Connect the oscilloscope between TP-1 and GND. AC V : 50mV/div H : 10μsec/div Adjust the chromacity signal to get the min. amplitude by VR200 and L205.

No.	ADJUST. ITEM	INPUT SIGNAL		SOURCE	CONDITION	A.Direction of S207	ADJUSTMENT
		TIMING	PATTERN				
26	DELAY LINE COIL	PAL	Color bar	VIDEO 1	-	-	Connect the oscilloscope between TP-1 and GND. DC V : 50mV/div H : 10μsec/div Adjust the waveform to get the min. amplitude by L207 as follows.
27	BELL FILTER	SECAM	Color bar	VIDEO 1	-	-	Connect the oscilloscope between TP-1 and GND. DC V : 50mV/div H : 10μsec/div Adjust the waveform to get the flat shape by LC203 as follows. 
28	REFERENCE COIL	SECAM	Color bar	VIDEO 1	-	-	Connect the oscilloscope between C2F7(TOP side) and GND. DC V : 1V/div H : 10μsec/div Adjust the voltage on C2F7 to get the max. voltage by LC202.
29	DISCRIMINAT. OR COIL	SECAM	No Video	VIDEO 1	-	-	Connect the oscilloscope between R257 and GND. DC V : 50mV/div H : 10μsec/div (1) Adjust LC201 to get the straight waveform as follows. Connect the oscilloscope between R257 and GND. (2) Adjust LC200 to get the straight waveform as follows. 

No.	ADJUST. ITEM	INPUT SIGNAL		SOURCE	CONDITION	A:Direction of S207	ADJUSTMENT
		TIMING	PATTERN				
30	WHITE BALANCE 9300R, B 6500R, B	NTSC	Color bar (with WHITE WINDOW)	VIDEO 1	COLOR : Min. CONT : Max. BRT : 0	A : ← or →	(1) Adjust the green color drive control to its center value by UP／DOWN switch. (2) Adjust the red and blue color drive controls as follows. 9300…X=0.283 Y=0.297 6500…X=0.313 Y=0.329
31	SUB CONTRAST VIDEO	NTSC	Color bar	VIDEO 1	COLOR : Min. CONT : Max. BRT : 0	A : ← or →	Adjust the brightness for a 300nits on the center of window pattern by UP／down switch.

DWG NO.

T1

T2

IC908 M51978

IC909 M51977

IC901 STR81143A

IC902

IC903 BR8106PH-12L

IC905 TLP733

IC906 TLP733

IC907 TLP733

IC909 TLP621

IC910 BCR10PM-12L

IC911 7805

IC912 7812

IC914 7824

IC915 2405

IC916(1/2) M5218L

IC917(1/2) M5218L

IC918(1/2) M5218L

RY901 NS 10078V -V03

F901 250V T6.3A

SW

AC

CP-1 AC

CP-2

CP-3

CP-5 DEFL

CP-6 CRT

CP-7 HT

CP-8 AUDIO

CP-9 WIDER

CP-11

CP-12

0.8A

0.4A

0.3A +5V

0.3A -5

DEGAUS

250V 0.02A

0.4A

50V 1.5A

50V 2.2A

0.7A

1.6A

0.7A

5V 0.4A

L923,L924,L929,L925,L930,11 coil RF 100MH

L907 ~ L920 ferrite bead BF-503

ﾀｲﾌﾟ ﾀﾞｲｵｰﾄﾞ 1S2471 / 1S2076A

第3角法 3RD ANGLE PROJECTION	DIM IN mm	R.E SCALE	作成日付 DATE
MITSUBISHI ELECTRIC CORPORATION NAGASAKI WORKS			
作成 DRAWN		承認 APPROVED	
照査 CHECKED			
設計 DESIGNED			

SCHEMATIC-DIAGRAM
POWER
XC-2930C

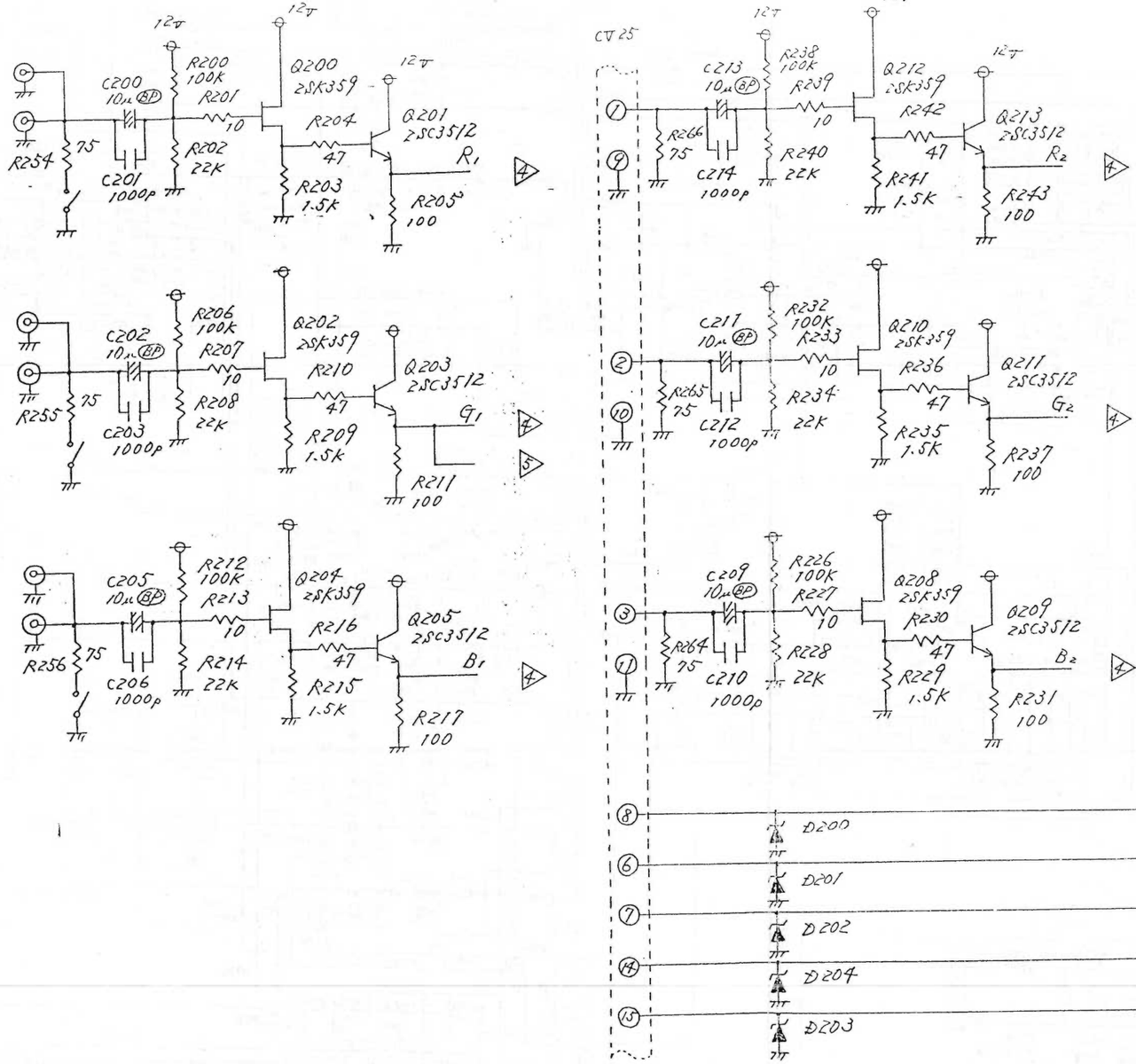
REV 1/1

改正 CHANGE

95

記録

DWG No.



図面コード	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45

改定 CHANGE

MITSUBISHI ELECTRIC CORPORATION
NAGASAKI WORKS

DIM. IN mm	作成日付 DATE		検認 APPROVED
尺度 SCALE	作成 DRAWN		
: NTS	照査 CHECKED		
	設計 DESIGNED		

XC-2930C

TITLE SCHEMATIC-DIAGRAM VIDEO

REV 1/8

1 2 96 3 6 7 8

記 録

DWG No.

VIDEO1 L
VIDEO1 R
VIDEO2 L
VIDEO2 R
RGB L
RGB R
VIDEO1
VIDEO2
S-VHS
SSO
SS1
COMP. VIDEO
IC215 MS1329P
IC216 MC14053
IC217 MC14052
IC218 MS13866L
DL201
DL200
T200
Q220 2SC1815
Q221 2SC1959
Q222 2SC1815
Q223 2SC1959
Q224 2SC1959
Q225 2SC1815
Q226 2SC1815
Q227 2SC1815
Q228 2SC1959
Q229 2SC1959
Q230 2SC1959
Q231 2SC1959
Q232 2SC1959
Q233 2SC1815
Q234 2SC1815
Q235 2SC1959
Q236 2SC1959
12V
GND
L
R
S205
S206

図面コード 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45

改定 CHANGE

MITSUBISHI ELECTRIC CORPORATION
NAGASAKI WORKS

DIM. IN mm	作成日付 DATE	— —	検認 APPROVED
尺度 SCALE	作成 DRAWN		
: NTS	照査 CHECKED		
	設計 DESIGNED		

TITLE

REV 2/8

記 録

DWG No.

改定 CHANGE

COMP. VIDEO
C2B6 10μ
R2S5 8.2K
R2S6 12K
Q245 2SC1959
LC204
DL203
R2S9 1.5K
R2S3 1.5K
R2S4 2.2K
SHARPNESS
R2L8 27K
R2L9 27K
R2L4 18K
R2L5 4.7K
SUB-CONT.V
R2M0 100K
R2M2 820K
R2L6 820K
R2L7 22K
R2M1 27K
2SA1015 Q252
2SA1015 Q251
2SA1015 Q250
R2U0 3.3K
C2D8 10μ
1.5K
R2T9
R2T3 4.7K
C2D1 22P
Q246 2SC1959
R2X3 4.7K
C2C7 0.01μ
C2D5 150p
L203 39μ
R2X2 470
R2T4 4.7K
C2D9 10μ
C2E0 0.1μ
C2D0 180p
R2S1 8.2K
R2S2 560
C2C9 0.47μ
C2D4 22μ
C2D2
C2C8 1μ
C2D3 0.47μ
C2D1 0.47μ
R2U1 8.2K
R2U2 3.3K
C2E2 C2E3
C2E1 0.1μ 0.1μ 0.1μ
R2T1 47
R2T2 470
Q247 2SC1959
R2T5 1.2K
Q248 2SC1959
R2T6 1.2K
Q249 2SC1959
R2V4 1/2W 68
R2S9 47
R2T0 470
R2S7 47
R2S8 470
R2T7 1.2K
B G R
R2U8 470
R2V6 2K
D224
R2V2 470
Q255 2SC1959
6.8K
R2V8
C2H4 0.01μ
C2H3 10μ
VIDEO H.S
C2E5 330p
Q253
R2V7 270
R2V5 390
R2U6 820
C2A6 0.022μ
D225
R2P7 150
R2V0
R2U9
R2U3 270
R2U7 3.3K
X203 3.3μ
C2F8 0.022μ
C2F9 0.022μ
R2V3 120
R2V9 390
+C2H2 0.47μ
C2H1 2700p
R2V1 120
R2U4 270K
R2T8 27K
R2U5 10K
C2E4 220p
IC219
C2C5 150p
C2C6 150p
R2N0 2.7K
C2A7 7p
C2E6 22μ
C2E7 0.01μ
R2N1 4.7K
C2A8 3p
LC200
LC201
R2M8 8.2K
R2M9 560
C2C3 180p
R2N2 390
C2A2 0.01μ
R2N3 2.2K
VR201 12μ
L207
L201
DX202
C2A0 0.01μ
R2N4 330K
C2E9 0.047μ
C2F0 0.01μ
LC203
C2A9 180p
R2N5
D223 D222
C2A4 18p
L202 12μ
C2A3 7p
R2P1 820
R2N6 22K
R2P2 820
R2N7
D221
C2C4 0.01μ
C2C9 0.01μ
R2N8 8.2K
Q238 2SA1015
Q237 2SA1015
R2P9 2.2K
R2P8 1K
R2Q1 2.2K
Q240 2SC1815
Q241 2SC1815
R2Q0 1K
R2Q3 1K
R2Q7
R2P6 100
100
Q242 2SC1815
Q239 2SC1815
12K R2P5
R2Q2 2.2K
VIDEO V.S
R2M5 1K
Q244 2SC1815
5.6K
R2M6 1K
Q243
R2M3
R2J5 22K
R2J6 270K
C2E8 0.01μ
R2J8 120K
R2L0 22K
R2L2 100K
R2L1 27K
R2L3 270K
COLOR
TINT
C2B8 C2B9 C2C0 C2C1 C2C2 C2F2 C2F1 C2F7 C2F3 C2F4 C2F5 C2F6
R2N9 1K
R2P4 1.5K
R2P3 1.5K
X201 3.58 MHz
X202 4.43 MHz
R2N9 1K
R2P4 33K
R2Q4 1K
C2F3 22P
C2F4 33P
C2F5 33P
C2F6 15P
C2F1 0.056μ
0.056μ
C2F2 0.056μ
LC202
LC203
R2Q6 1K
C2C5 150p
C2C6 150p
C2C3 180p
C2C9 0.47μ
C2D4 22μ
C2D2
C2C8 1μ
C2D3 0.47μ
C2D1 0.47μ
C2D9 10μ
C2E0 0.1μ
C2D0 180p
C2D5 150p
C2D8 10μ
C2E2 C2E3
C2E1 0.1μ 0.1μ 0.1μ
C2E6 22μ
C2E7 0.01μ
C2E8 0.01μ
C2E9 0.047μ
C2F0 0.01μ
C2F7 0.01μ
C2F8 0.022μ
C2F9 0.022μ
C2H0 0.022μ
C2H1 2700p
C2H2 0.47μ
C2H3 10μ
C2H4 0.01μ
C2A0 0.01μ
C2A2 0.01μ
C2A3 7p
C2A4 18p
C2A6 0.022μ
C2A7 7p
C2A8 3p
C2A9 180p
C2B8 10μ
C2B9 10μ
C2C0 2.2μ
C2C1 2.2μ
C2C2 2.2μ
C2C4 0.01μ
C2C7 0.01μ
C2C9 0.47μ
C2D0 180p
C2D1 0.47μ
C2D2 22μ
C2D3 0.47μ
C2D4 22μ
C2D5 150p
C2D8 10μ
C2D9 10μ
C2E0 0.1μ
C2E1 0.1μ 0.1μ 0.1μ
C2E2 C2E3
C2E4 220p
C2E6 22μ
C2E7 0.01μ
C2E8 0.01μ
C2E9 0.047μ
C2F0 0.01μ
C2F1 0.056μ
C2F2 0.056μ
C2F3 22P
C2F4 33P
C2F5 33P
C2F6 15P
C2F7 0.01μ
C2F8 0.022μ
C2F9 0.022μ
C2H0 0.022μ
C2H1 2700p
C2H2 0.47μ
C2H3 10μ
C2H4 0.01μ
C2J8 120K
C2Z9 0.01μ
C2Z9 0.01μ

図面コード 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45

MITSUBISHI ELECTRIC CORPORATION
NAGASAKI WORKS

DIM. IN mm	作成日付 DATE	—	—	検認 APPROVED
尺度 SCALE	作成 DRAWN			
: NTS	照査 CHECKED			
	設計 DESIGNED			

TITLE

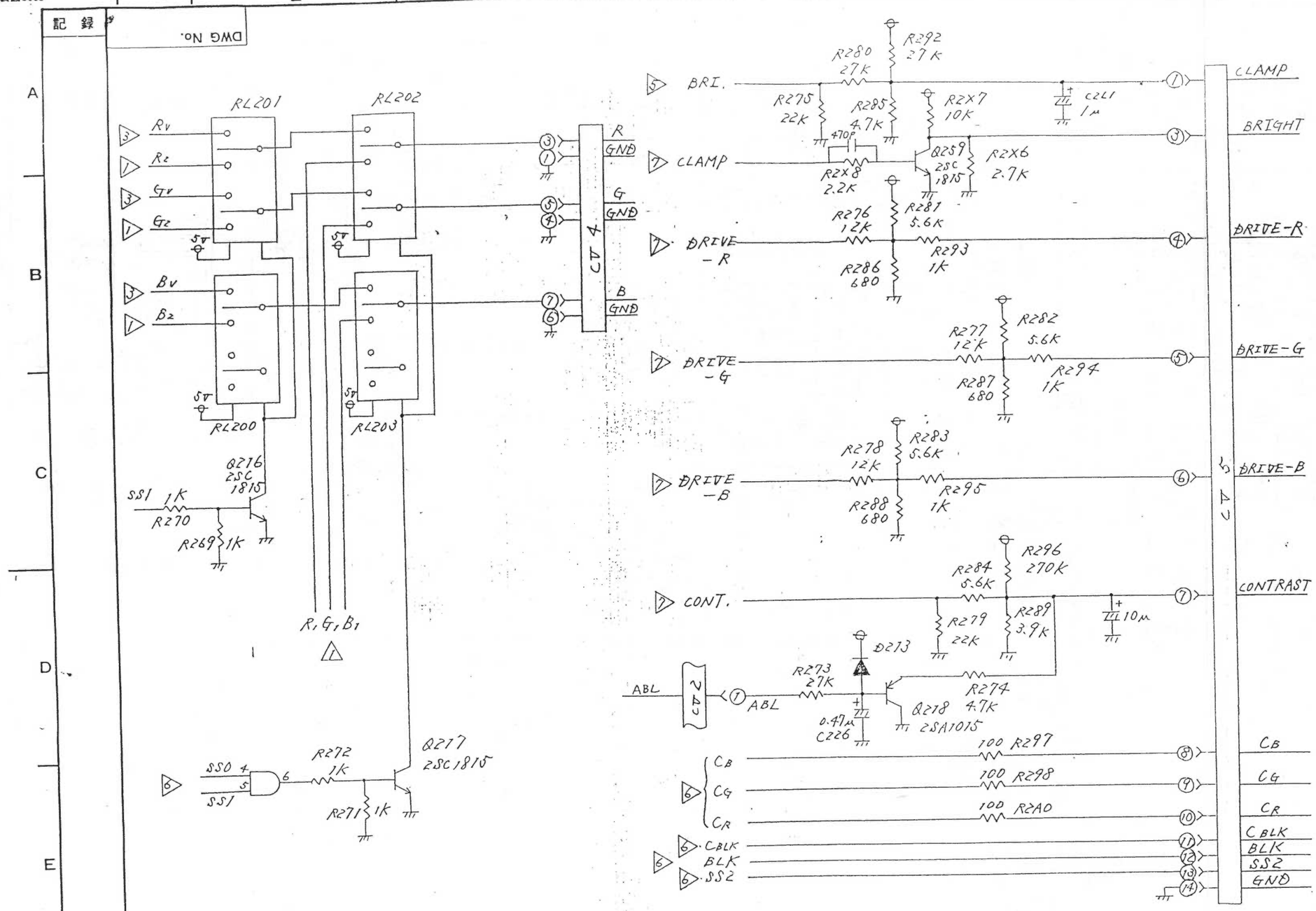
REV

3/8

製図3003

記 録

DWG No.



図面コード	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45

改定 CHANGE

MITSUBISHI ELECTRIC CORPORATION
NAGASAKI WORKS

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	設計 DESIGNED		

TITLE

REV 4/8

記録

DWG No.

RGB1 HS

RGB2 HS (75Ω)

HS (HIGH)

RGB1 VS

RGB2 VS (75Ω)

VS (HIGH)

S203

HSV

VSV

IC206 MC14052BCP

IM52001SP

IC213 LS221 (1/2)

IC224 LS221 (1/2)

CLMP

P.I1

P.I2

P.I3

P.I4

F/V

H-LIMIT

HD

H-PHASE

S/G

SSO

SS1

01 A2

MITSUBISHI ELECTRIC CORPORATION
NAGASAKI WORKS

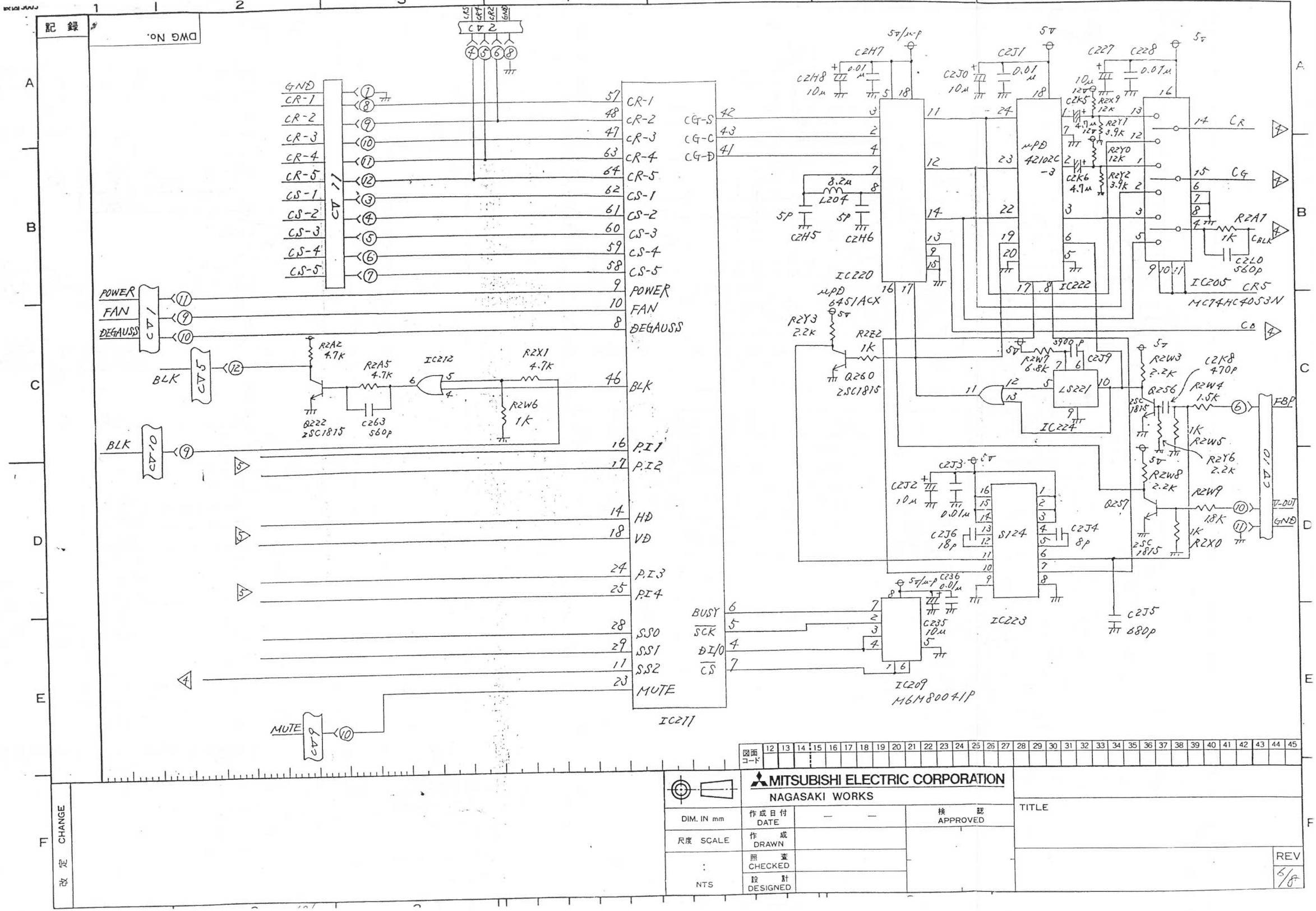
DIM. IN mm	作成日付 DATE	— —	検認 APPROVED
尺度 SCALE	作成 DRAWN		
: NTS	照査 CHECKED		
	設計 DESIGNED		

TITLE

REV

5/8

改定 CHANGE


記録
DWG No.
CA2
CA11
GND
CR-1
CR-2
CR-3
CR-4
CR-5
CS-1
CS-2
CS-3
CS-4
CS-5
POWER
FAN
DEGAUSS
CA1
CA5
BLK
R2A2 4.7K
R2A5 4.7K
IC212
R2X1 4.7K
R2W6 1K
Q222 2SC1815
C263 560P
CA3
P.I1
P.I2
HD
VD
P.I3
P.I4
SS0
SS1
SS2
MUTE
IC211
CG-S
CG-C
CG-D
BUSY
SCK
DI/O
CS
CA4
IC209 M6M80041P
C2H7
C2H8 10μ
C2J1
C2J0 10μ
C227
C228
C2K5
R2X9 12K
R2Y1 3.9K
R2Y0 12K
R2Y2 3.9K
C2K6 4.7μ
L204 8.2μ
C2H5
C2H6
IC220
μPD 64516CX
IC222
μPD 42102C-3
IC205
MC74HC4053N
CR
CG
CB
CBLK
R2A7 1K
C2L0 560P
R2Y3 2.2K
R2Z2 1K
Q260 2SC1815
R2W7 6.8K
C2J9
IC224
LS221
R2W3 2.2K
C2K8 470P
R2W4 1.5K
Q256
R2W5 1K
R2Y6 2.2K
R2W8 2.2K
R2W9 18K
R2X0 1K
Q257
FBP
V-OUT
GND
C2J3
C2J2 10μ
C2J6 18P
S124
C2J4 8P
C2J5 680P
IC223
C236 0.01μ
C235 10μ
CHANGE
改定
図面コード
MITSUBISHI ELECTRIC CORPORATION
NAGASAKI WORKS
DIM. IN mm
尺度 SCALE
NTS
作成日付 DATE
作成 DRAWN
照査 CHECKED
設計 DESIGNED
検認 APPROVED
TITLE
REV

記録

DWG No.

DIM. IN mm	作成日付 DATE	— —	検認 APPROVED
尺度 SCALE	作成 DRAWN		
: NTS	照査 CHECKED		
	設計 DESIGNED		

MITSUBISHI ELECTRIC CORPORATION
NAGASAKI WORKS

TITLE

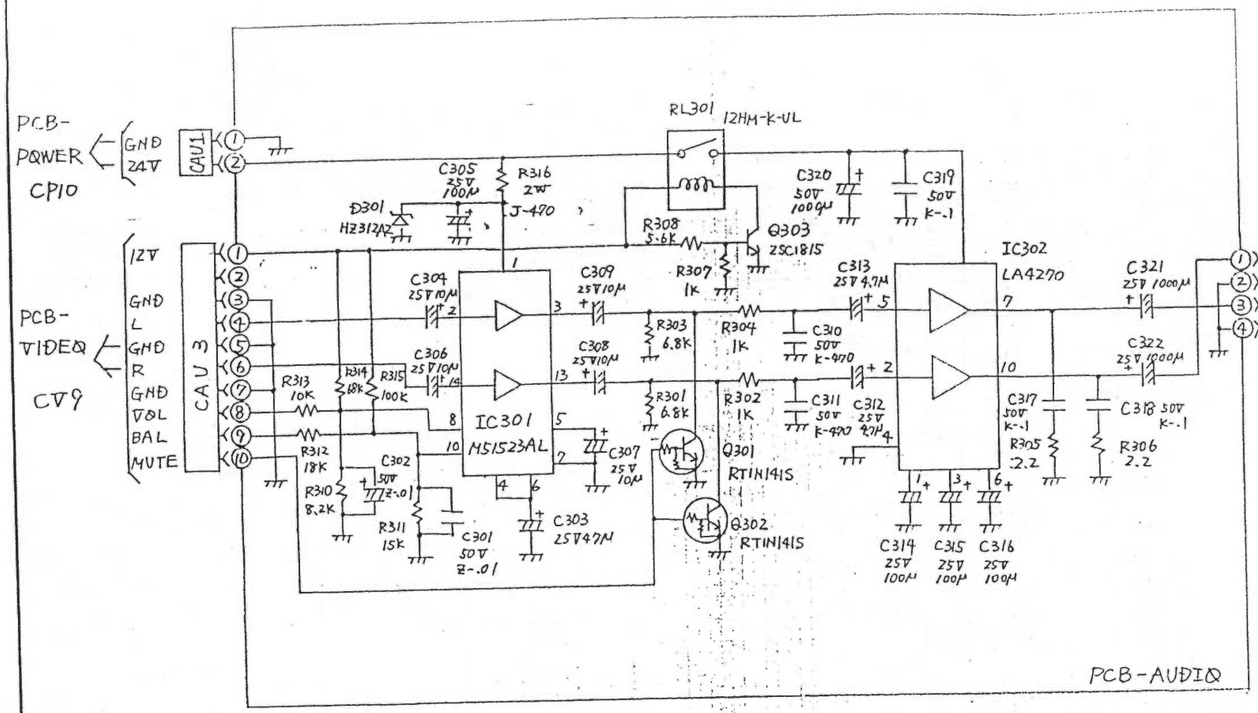
REV 1/8

改定 CHANGE

製図3003

記録

DWG No.



改定 CHANGE			
DIM. IN mm	作成日付 DATE		検認 APPROVED
尺度 SCALE	作成 DRAWN		
: NTS	照査 CHECKED		
	設計 DESIGNED		

MITSUBISHI ELECTRIC CORPORATION
NAGASAKI WORKS

XC-2930C

TITLE
SCHEMATIC - DIAGRAM
AUDIO, SW

REV 1/1

記 録

DWG No.

改 定 CHANGE

MITSUBISHI ELECTRIC CORPORATION NAGASAKI WORKS			
DIM. IN mm	作成日付 DATE		検認 APPROVED
尺度 SCALE	作成 DRAWN		
: NTS	照査 CHECKED		
	設計 DESIGNED		

XC-2930C

TITLE CIRCUIT DIAGRAM

(ホ:ATC) DEFL

REV 1/5

図面コード

製図3003

記録

DWG No.

CHANGE 改定

CONT.
CLAMP
BRI.
DRIVE-R
SS2
DRIVE-G
DRIVE-B
BLK

CAS2
CAS3
CAS5
CAS6
CAS7

IC2R1 LM1201N
IC2G1 LM1201N
IC2B1 LM1201N
IC225 MC74HC4053N

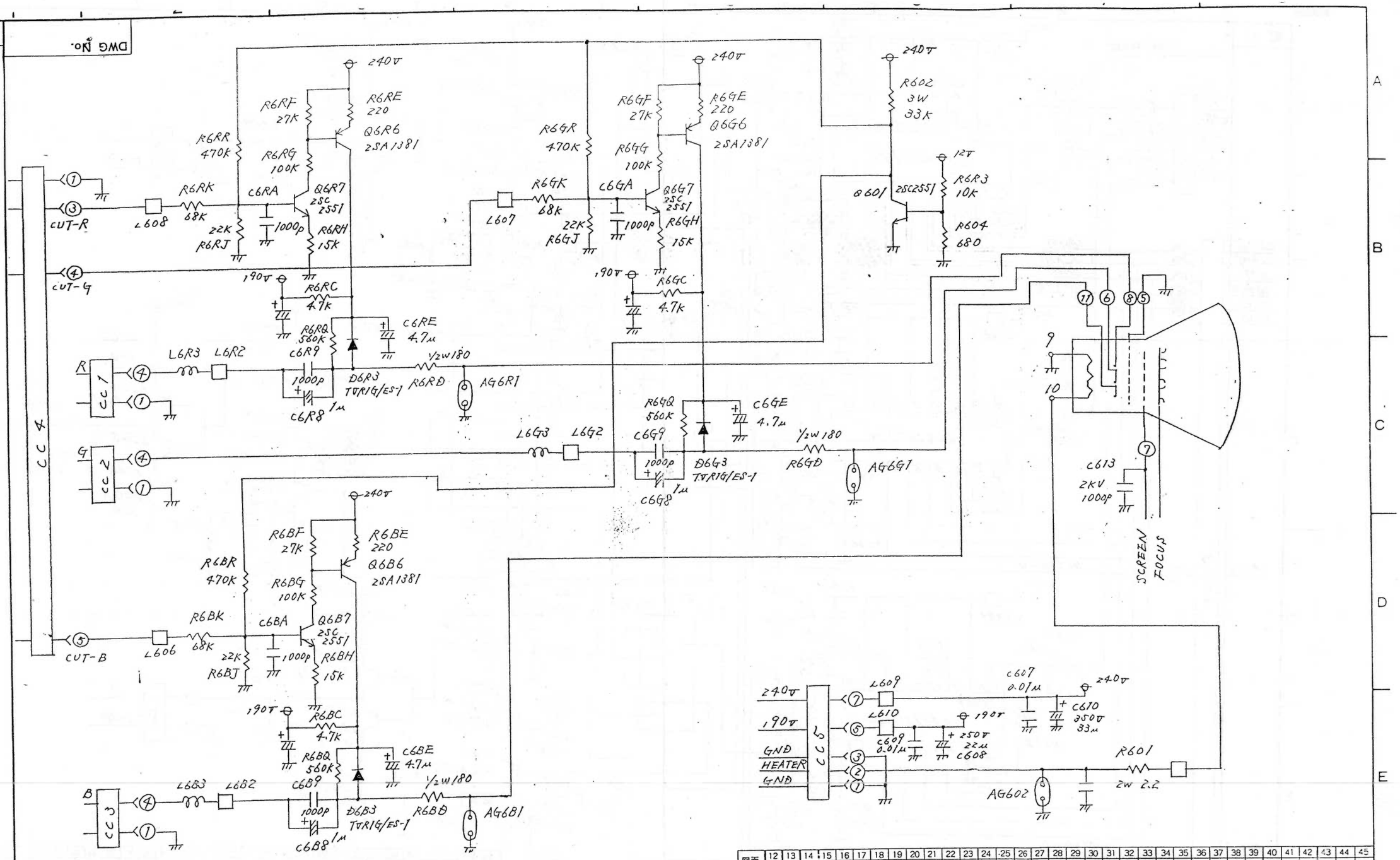
RL2R1
RL2G1
RL2B1

MITSUBISHI ELECTRIC CORPORATION
NAGASAKI WORKS

DIM. IN mm	作成日付 DATE	— —	検認 APPROVED
尺度 SCALE	作成 DRAWN		
: NTS	照査 CHECKED		
	設計 DESIGNED		

TITLE

REV 3/8



MITSUBISHI ELECTRIC CORPORATION NAGASAKI WORKS			XC-2930C
DIM. IN mm	作成日付 DATE		様認 APPROVED
尺度 SCALE	作成 DRAWN		TITLE SCHEMATIC-DIAGRAM CRT
: NTS	照査 CHECKED		REV 1/1
	設計 DESIGNED		

改定 CHANGE

記録

DWG No.

記 録

DWG No.

CDS1 from CD8

GND / 50V / 12V / 24V / GND / B4 / +B / GND / FBP

L5A3 27μ　L5A2 27μ　C5A4 35V 100μ

D5C1 HZ16

C5A3 25V 100μ

C5A1 100V 100μ

C5A2 100V 100μ

SBC-101-242

L5A4

C5A4 25V 33μ

D5A11

R5A1 1K　R5A2 1K　Q5A2 2SC2482　47K　R5A3

C5A1 100V 47μ　2SD 921　Q5A1　40V

FML-135　BL02R　L5B7　SEC34　BL02RN2　L5A6　FBF503　L5A5　C5A5 25V 100μ

D5A2　C5A6 25V 100μ

Q5A3 2SK934

D5A3 HZ7

R5A5 (R5G1) 1W 0.22

R5F0 100　R5F3 47　R5A4 100K　D5A4 HZ16-2

C5E9 50V 1032

L5E1　FBF503　R5E6 33　D5E2

IC5E2 (M51978)

SOFT　Vcc　C　OUT　REG　F/B　T-OFF　CF　T-ON　CLM

C5E7 22μ 25V　R5E7 2.2K　R5F6 47K-F　1800P　C5F0

R5B6 1K　R5E8 1.2K　TL431 IC5E3

C5G1 50V 1μ　C5B4 25V 10μ

D5A1 R5C5 47K　R5C4 1K　Q5A9 2SA1015

R5F2 100K　C5F1 50V 1μ　R5E9 22μ 25V

R5F7 100　C5F2　D5E1　R5B5 1K　C5B1 1000P　1032　R5E1 10K　R5F5 2.2K　R5F4　Q5E1

C5A8 200V 22μ　R5A9　C2317　Q5A5

R5A8 4.7K

R5A6 2W 220　2SD 921　Q5A4

R5A7

RL-2Z (裏付け)

T501

R5B0 3.3K　ZW 39K　R5B1 ½W 220

R5B7 1.6K　1800P C5B7　3W 100K R5C7　DHS 200V 3.3μ C5A7

RP1H 5.6Ω　R5C6　D5A8　D5A7　RC2　D5A9

HOT

R5B2 1

D5A5 TVRIG/ES-1

C5B0 50V 10μ

R5B3 120K-F　R5B4 6.8K-F 8.2K-F

C5A9 50V 4.7μ

C5E1 25V 470μ

IC5E1 (4052)　B(MSB)　A　0Y 2Y YC 3Y 1Y 1H VE　VD　VS

R5E2 33K-F　15K-F　R5E3 39K-F　R5E4　R5E5

~~12K-F~~ 11K-F　~~24K-F~~

C5E5 50V 1μ

C5E4 50V 1μ

C5B2 100P

CDS2 from CD7

H-HD　CR3.4.5.CS1　GND　CS1　CR5　4　3　GND　H-WID　GND　H-HD　HD1　CR1'　CR2'　PCC

CDS3 to CRT

DBF　C5B5 2KV 4700P　GND

VCP　VDY

12V　FBP　B4　+B　J4　J5

FBP　5V　12V　VS　H-BLK'　VD-PRO　H-HD-PRO

C533 IC510　78L05　FBF503　50V 0.33μ　1032

R562 150K　C528 330P　R555 10K　Q504　R552 100K　R554 10K

IC506 (½)　LS123　R556 1.5K 50V　R565 2.2K　R571 1K　D509　R566 6.8K　R570 4.7K　Q508　D508　D504　560　R557

R558 150K　R563 1.5K　C526 1μ　C525 50V 1032　R569 100　D510　D505　D507　560　R564

IC506 (⅔)　LS123　R567 5.6K

指定なき抵抗は ¼W R-C，ダイオードは 1S2076，トランジスタは 2SC1815

図面コード 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45

改定 CHANGE

MITSUBISHI ELECTRIC CORPORATION
NAGASAKI WORKS

DIM. IN mm	作成日付 DATE	— —	検認 APPROVED
尺度 SCALE	作成 DRAWN		
: NTS	照査 CHECKED		
	設計 DESIGNED		

TITLE

(水平電源)

REV 2/5

記録

DWG No.

Q5B0 Q5B1 Q5B2 Q5B3 Q5B4 Q5B5

1MB12-140

D5B7 R5D9 D5B6 R5D8 D5B5 R5D7 D5B4 R5D6 D5B3 R5D5 D5B2 R5D4

L5B1 ZBF503 L5B2 L5B3 L5B4 L5B5 L5B6

½w 1K

R5D3 22K 10K R5D2 22K 10K R5D1 22K 10K R5D0 22K 10K R5C9 22K 10K R5C8 22K 10K

50V 4.7μ C5C3 C5C2 C5C1 C5C0 C5B9 C5B8

D5B8 FMP-3FS

C5C5 2700P →700P C5C6 1800V 2700P C5C7 2700P 470

12V C5B3 103Z

IC5A1 HD29026

R5B7 220 R5B8 2.2K R5B9 2.2K R5C0 R5A1 R5C1 56 R5A2 120

Q5A8 Q5A7 Q5A6 Q5A2 2SC2236 ×4

H-HD CR3.4.5, CS1 CR3 CR4 CR5 CS1 12V **

C5B6 25V 10μ C561 25V 47μ

CR1 CR2 CR3.4.5

CD2 from VIDEO

JD1 JD1

CR5 CR4 CR3 CR2 CR1 CS5 CS4 CS3 CS2 CS1 GND

CS5 CS4 CS3 CS2 CS1 GND

LHG 400V J=1 0.82 J=27 J=22 J=22 J=33 J=27 J=47 J=1 J=1

C556 C555 C554 C553 C552 C551 C550 C549 C548 C547

R559 3.3K R598 R597 R596 R595 2SK820×5

L509 ZBF503 L508 L507 L506 L505

Q522 Q514 Q521 Q513 Q520 Q512 Q519 Q511 Q518 Q510

0.1+0.1 0.39+0.47 0.22+0.22 0.47+0.27 1μ+1μ

RTIN1415×5

VS-12TBU RL5A1 D5B1 EM-1Z C5C8 6800P 1800V 5600P

R5C3 2SK793 Q5B7 D5B9 HZ16-2 C5D3 50V103Z 1800V 3300P C5C9 1500P

R5C2 470 2SK793 Q5B6 D5C0 C5D2 HZ16-2 C5D0 6800P C5D1 1800V 3300P RL5A3

D5A1 (CR5) 12V D5B0 EM-1Z RL5A2 VS-12MB (CR4) (CS1)

L5A7 L5A8 L5A9 L5B0 R5E0 ½w 470 3w 220 C5C4 2KV 1000P

VCP VDY 12V SH2

ĐY-H ĐY-IN ĐY

CDS4 VCS GND

LHG 400V 0.068μ×4 C557 C558 VCS C560 C559 GND CD9

H3SC1 D515 D514 R593 2W 39K 5% R592 2.2K Q517 2SA1321

190V J1 190 SH1 +5V SH4

Q515 2SD2012 R594 3W 27Ω 12Ω Q516 2SB1375 L504 2.0μ

C546 25V 100μ R591 3.3K 25V 100μ C COMN SH4 R590

D513 -5V SH2 H-POSI SH1

指定抵抗ハ ¼W、4ヶ所ハ ½2W

図面コード 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45

改定 CHANGE

MITSUBISHI ELECTRIC CORPORATION
NAGASAKI WORKS

DIM. IN mm	作成日付 DATE	— —	検認 APPROVED
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	設計 DESIGNED		

TITLE

(H-OUT)

REV 3/5

A B C D E F

1 2 3 4 5 6 7 8

記録

DWG No.

IC402 μPD6326 — L / C / D / GND — pin 16 1 13 12 11 9 10 14 5 15 8
V-POSI
V-HOLD
FV-HOLD
V-HIGHT
FV-HIGHT
PCC-PH

IC404 TDA1675A
Vs, AMP-Vs, FBK, AMP-OUT, GND, AMP IN(-), OSC, OSC, TP2, OSC (V-AFC), HIGHT ADJ., SYNC IN, RAMP-GEN, RAMP OUT

IC401 μPD6326 — C / D / L / Vcc — pin 1 6 9 10 11 8 16
V-LIN

IC403

D401 S5500-E
D402 S5500D
D403 HZ36-2
D404 50V 0.15μ
D405
D406 10K
D407 HZ33
D408 2SC3620
D409 2SK934 D
D410 S3300D
D411 HZ33
D412 2SA 1648
D413 S5500-D
D414 2SC2482

Q401 H-BLK, H-BLK', FBP, HD, 12V
Q402 RT1N141S
Q403
Q405 2SD 2012
Q406 2SD 2012
Q407 2SB1375
Q409 2SC2482
Q410 2SC2482
Q411
Q413 2SD1408
Q414 2SB1017

JD1 JD3 JD3 — SH1 12V*, +5V, COMN, -5V, GND, 24V, 28V, GND, PCC
JD2 JD2 — VD, BLK, V-OUT, GND
JD4 — Pcc, VPAR - Vcc, 12V*, B4'
JD5 — V-SAW, PCC-PHASE, 24V, PCC-GAIN
J2 B4
J3

CD1 from VIDEO — DA-C, DA-D, DA-L1, DA-L2, GND 10Ω×3
CD10 to CRT — 12V, H-PAR, V-PAR, GND
CD3 from VIDEO — VD, BLK, V

L401 27μ, L402 27μ, L403 27μ

R406 6.8K, R407 10K, R408 10K, R409 6.8K, R410 15K(ショート) +5K- OPEN, R411 10K, R412 47K, R413 47K, R414, R415 10K, R416 18K, R417 68K, R418 6.8K, R419 +8K- 10K, R420 6.8K, R421 22K, R422 22K, R423 6.8K, R424 10K, R425 1K, R426 12V* 15K, R427 4.7K, R428 12K, R429 560, R430 ½W 10, R431 ½W 10, R432 10K, R434 2W 220-J, R435 10K, R436 68K, R437 47K, R438 10K, R439 68K-Fi, R440 56K-Fi, R441 18K, R442 47K, R443 5.6K, R444, R445 68K, R446 68K, R447 1M, R448 180K, R449 150, R450 2K-Fi, R451 68Ω, R452 330, R453 2W 1.5, R454 2.7K -Fi, R455 27K, R456 ½W 68K, R457 220K, R458 2.2K, R459 ½W 68K, R460 ½W 1K, R461 47K, R462 2W 39, R463 2W 6.8K, R464 1K, R465 6.8K, R466, R467 2W 2.2 100V 0.22-J, R468 3W 470, R469 3W 470, R470 2W 1, R471 2W 1, R472 82K, R473 150K-Fi 120K, R475, R476 10Ω×3, R477 15K 3.3K, R478 100, R479 82K, R480 27, R401 8.2K, R402 270K

C401 35V 470μ, C402 25V 100μ, C404 25V 100μ, C405 50V 0.01μ (MF), C406 1μ 50V, C407 25V 10μ, C408 50V 1μ, C409 25V 3300μ, C410 500V 4700p, C411 25V 33μ, C412 35V 50V 470μ, C413 10 (MF) 0.1μ, C414 (MF), C415 0.1μ, C416 (MF) 0.1μ, C417 (MF), C418 35V 470μ, C419 0.22-J, C420 35V 100μ, C421 200V 33μ, C562 100p

28V, 24V, 190V, 12V*, 5V, 12V, 24V, VD, VS, H-BLK, H-BLK', FBP, HD, 12V, B4, B4', Pcc, VPAR - Vcc, V-SAW, PCC-PHASE, PCC-GAIN, V-DY

※ドライバの並に

図面コード	12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45

MITSUBISHI ELECTRIC CORPORATION
NAGASAKI WORKS

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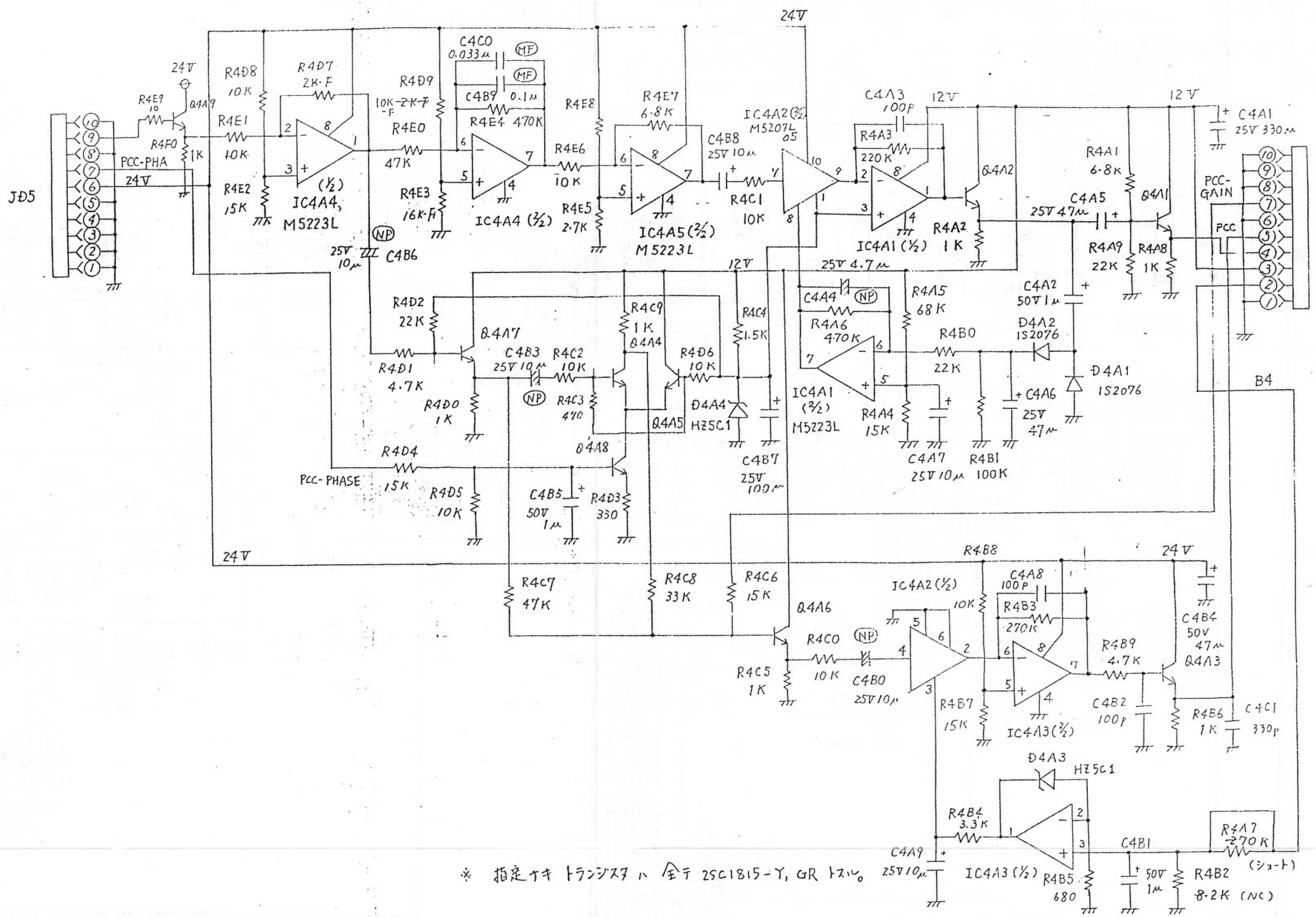
尺度 SCALE	作成 DRAWN		
: NTS	照査 CHECKED		
	設計 DESIGNED		

TITLE: (V-DEFL)

REV 4/5

改定 CHANGE

109



※ 指定ナキ トランジスタ ハ 全テ 2SC1815-Y, GR トスル。

| | | |

製図3003

記 録

DWG No.

改 定 CHANGE

FBT T701

ANODE CRT

SCREEN

FOCUS

SR-TR

IC701 HD29026

IC703

CH-2

CH-4

D706 CTU-G2DR

Q703 K1365

Q704 K1365

Q705 K793

Q706 K793

Q707 C1815

Q709 C1815

Q710 2SC3112B

Q711 K1808

Q712 K1808

Q702 K935

TH701

IC702 HA17393

D702 HZ18-2

D703 FML-13S

D704 RU-2B

D705 RU-2B

D714 RU2B

D715

D716 RU2B

D717 HZ16-2

D718

D719 R750

D720 R762 R-FUSE 1/2W 1.2

D721 R763 1/2W 1.2

D722 HZ7C2

D723

D724 R744

D725 HZ16-1

D726

D707 HZ16-2

D708 HZ16-2

D709

D710

D711

D712

D713

L701

L703

L704

L705 27μH

L706

L707 350μH

L708

L709 100MH

L720

5.6K 1/2W

5.6K 1/2W

1500PF 60KV

300PF

190V

24V

C710 C-H-PP 0.01μ

C712 C-H-PP 0.01μ

C711 C-H-PP 0.01μ

C708 C-H-PP 2200P

C709 C-H-PP 3300P

C732 500V 330μ

C733 500V 100μ

C734 500V 1μ

C737 C-POL 500V 0.01μ

C720 C-H-PP 3900P

C738 500V 1032

C731 50V

C741 500V 0.01μ

C743 500V 0.1μ

C746 50V 10μ

C716 50V 100μ

C717 50V 4.7μ

C718 250V 22μ

C721 500V 47μ

C722 50V 10μ

C723 50V 47μ

C724 50V 47μ

C725 C-POL 0.1μ

C726 0.033

C727 50V 0.01μ

C728 50V 0.01μ

C739 50V 0.1μ

C744 25V 10μ

C745 25V 47μ

C735 C-POL 5000PF

C736 500V 0.1μ

R708 1/4W 220

R709 1/2W 10K

R711 1/4W 1K

R710 1/2W 10K

R712 1/2W 1K

R713 1/4W 18K-F

R714 1/4W 10K-F

R715 1/4W 10K

R716 1/4W 10K

R717 1/4W 10K

R718 1/4W 10K

R722 1/4W 1K

R723 1/4W 1K

R705 METAL 2W 0.22

R706 1/4W 2700K-F

R707 1/4W 3.9K-F

R738 1/4W 120

R761 1/2W 330

R721 1/4W 1K

R720 1/4W 10K

R719 1/4W 10K

R759 1/2W 220

R756 1/4W 39K

R769 1/4W 3.9K-F

R737 1/4W 11K-F

R736 1/2W 1.2

R735 1/4W 3.9K-F

R734 1/4W 3.9K-F

R724 1/4W 3.3K

R725 1/4W 3.3K

R726 10K-F

R727 100K-F

R728 1/4W 56K

R729 47K

R730 27K

R732 1/4W 1K

R733 1/4W 1K

R731 1/4W 47K

R738 1/2W 150K-F

R771 1/4W 2.2K

R770 1/4W 1K

R765 1K

R739 1/4W 10K-F

R740 1/4W 10K-F

R741

R742 1/4W 10K-F

R743 1/4W 2.7K

R744 1/4W 330K

R745 1/4W 0.1μ

R746 1/4W 82K-F

R747 1/4W 150

R748 1/4W 82

R749 1/4W 56K-J

R750 1/4W 56

R751 1/4W 56

R752 1/4W 10K-F

R753 1/4W 10K-F

R704 1/4W 100K

R772 2.2K

R773 2.2K

R774 100

R775 2.7K

R776 10K

R777 1/4W 1K

R778 1/4W 10K

R779 1/4W 10K

R780 1/4W 10K

R781 1/4W 10K

R782 1/4W 10K

R783 1/4W 10K

R784 1/4W 10K

R785 16K-F

R786 100P

R787 82K-F

R788 1/4W 150K-F

R789 1/4W 10K

R790 1/4W 10K

R791 1/4W 10K

R792 1K

R793 2.2K

R794 1/4W 10K

R795 1/4W 10K

R796 1/4W 10K

R797 1/4W 10K

R798 1/4W 10K

VR701 100K

VR702 30K

VR703 10K

VR710

VR711

Q715 2SC3311

Q714 2SC1815

D722 HZ7C2

D723

D724

D708 HZ16-2

D707 HZ16-2

D702 HZ18-2

D703 FML-13S

D704 RU-2B

D705 RU-2B

D706 CTU-G2DR

D707

D708

D709

D710

D711

D712

D713

D714 RU2B

D715

D716 RU2B

D717 HZ16-2

D718

D719 R750

D720 R762 R-FUSE 1/2W 1.2

D721 R763 1/2W 1.2

D722 HZ7C2

D723

D724 R744

D725 HZ16-1

D726

IC703 TL431

IC702 HA17393

TH701

L701

L703

L704

L705 27μH

L706

L707 350μH

L708

L709 100MH

L720

5.6K 1/2W

5.6K 1/2W

1500PF 60KV

300PF

190V

24V

C710 C-H-PP 0.01μ

C712 C-H-PP 0.01μ

C711 C-H-PP 0.01μ

C708 C-H-PP 2200P

C709 C-H-PP 3300P

C732 500V 330μ

C733 500V 100μ

C734 500V 1μ

C737 C-POL 500V 0.01μ

C720 C-H-PP 3900P

C738 500V 1032

C731 50V

C741 500V 0.01μ

C743 500V 0.1μ

C746 50V 10μ

C716 50V 100μ

C717 50V 4.7μ

C718 250V 22μ

C721 500V 47μ

C722 50V 10μ

C723 50V 47μ

C724 50V 47μ

C725 C-POL 0.1μ

C726 0.033

C727 50V 0.01μ

C728 50V 0.01μ

C739 50V 0.1μ

C744 25V 10μ

C745 25V 47μ

C735 C-POL 5000PF

C736 500V 0.1μ

R708 1/4W 220

R709 1/2W 10K

R711 1/4W 1K

R710 1/2W 10K

R712 1/2W 1K

R713 1/4W 18K-F

R714 1/4W 10K-F

R715 1/4W 10K

R716 1/4W 10K

R717 1/4W 10K

R718 1/4W 10K

R722 1/4W 1K

R723 1/4W 1K

R705 METAL 2W 0.22

R706 1/4W 2700K-F

R707 1/4W 3.9K-F

R738 1/4W 120

R761 1/2W 330

R721 1/4W 1K

R720 1/4W 10K

R719 1/4W 10K

R759 1/2W 220

R756 1/4W 39K

R769 1/4W 3.9K-F

R737 1/4W 11K-F

R736 1/2W 1.2

R735 1/4W 3.9K-F

R734 1/4W 3.9K-F

R724 1/4W 3.3K

R725 1/4W 3.3K

R726 10K-F

R727 100K-F

R728 1/4W 56K

R729 47K

R730 27K

R732 1/4W 1K

R733 1/4W 1K

R731 1/4W 47K

R738 1/2W 150K-F

R771 1/4W 2.2K

R770 1/4W 1K

R765 1K

R739 1/4W 10K-F

R740 1/4W 10K-F

R741

R742 1/4W 10K-F

R743 1/4W 2.7K

R744 1/4W 330K

R745 1/4W 0.1μ

R746 1/4W 82K-F

R747 1/4W 150

R748 1/4W 82

R749 1/4W 56K-J

R750 1/4W 56

R751 1/4W 56

R752 1/4W 10K-F

R753 1/4W 10K-F

R704 1/4W 100K

R772 2.2K

R773 2.2K

R774 100

R775 2.7K

R776 10K

R777 1/4W 1K

R778 1/4W 10K

R779 1/4W 10K

R780 1/4W 10K

R781 1/4W 10K

R782 1/4W 10K

R783 1/4W 10K

R784 1/4W 10K

R785 16K-F

R786 100P

R787 82K-F

R788 1/4W 150K-F

R789 1/4W 10K

R790 1/4W 10K

R791 1/4W 10K

R792 1K

R793 2.2K

R794 1/4W 10K

R795 1/4W 10K

R796 1/4W 10K

R797 1/4W 10K

R798 1/4W 10K

VR701 100K

VR702 30K

VR703 10K

VR710

VR711

Q715 2SC3311

Q714 2SC1815

Q712 K1808

Q711 K1808

Q710 2SC3112B

Q709 C1815

Q708 C1815

Q707 C1815

Q706 K793

Q705 K793

Q704 K1365

Q703 K1365

Q702 K935

Q701

CH-2 (1 2 3) H.O GND

CH-4 (1 2 3 4 5 6 7 8 9) 400V NC GND 10.5V 5.0V GND GND 12.0V 24.0V GND

CH-W (8 7 6 5 4 3 2 1) GND HA CR3 CR4 CR5 H.V ABL

指定ナショダイオード 1S2471/1S2076A

図面コード 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45

MITSUBISHI ELECTRIC CORPORATION
NAGASAKI WORKS

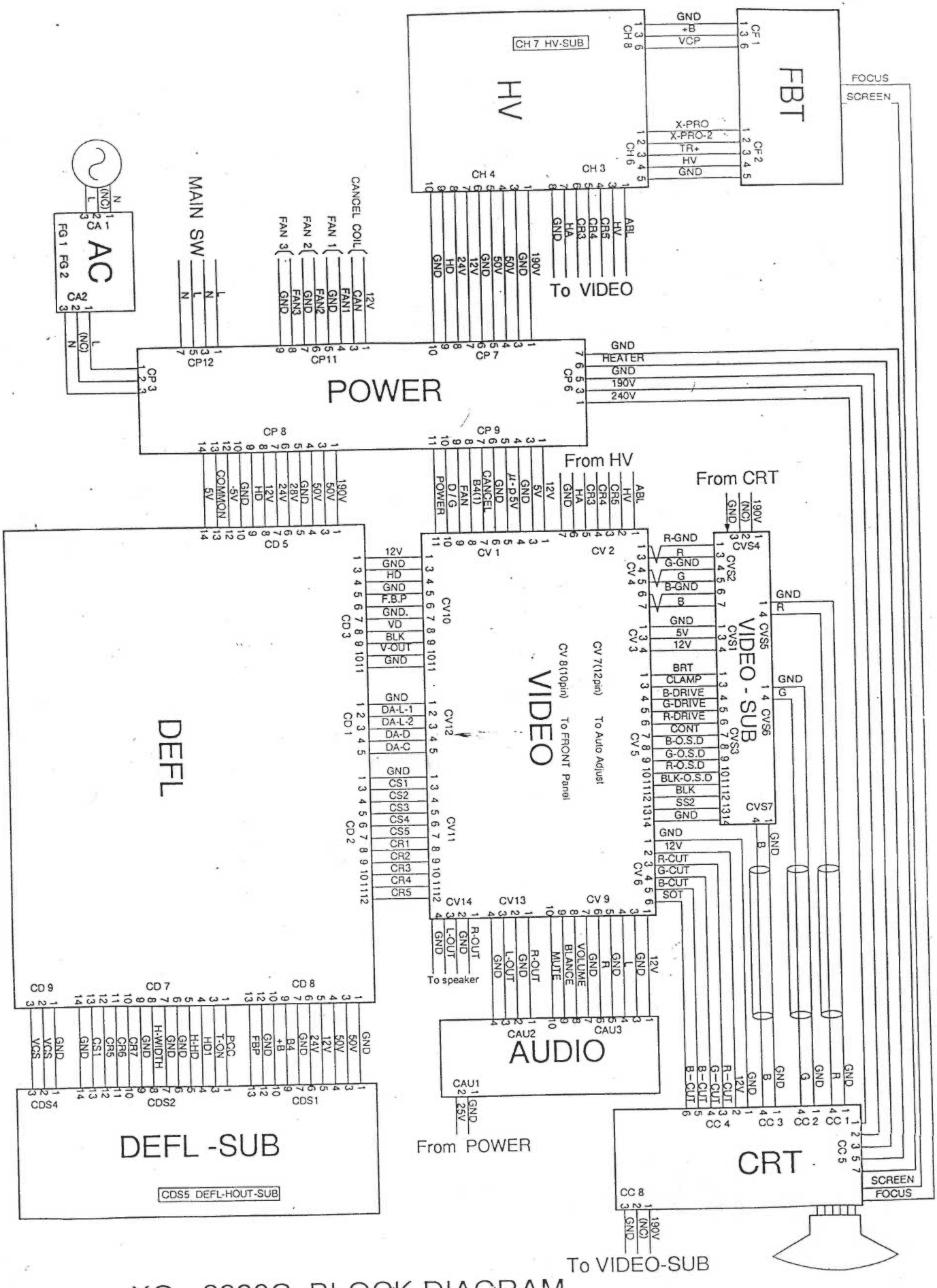
XC-2930C

TITLE SCHEMATIC-DIAGRAM -HV

DIM. IN mm	作成日付 DATE		検認 APPROVED
尺度 SCALE	作成 DRAWN		
: NTS	照査 CHECKED		
	設計 DESIGNED		

REV 1/1

111



XC - 2930C BLOCK DIAGRAM

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